THE IRON TRADE REVIEW

Volume XLII CLEVELAND, MAY 21, 1908 Number 21

CHEERING NEWS

OF IMPROVEMENT IN THE PIG IRON MARKET.

Some Heavy Sales Made and Many Inquiries Pending—Coke Also Shows Change for Better—Finished Material Quiet.

News concerning the pig iron market from all parts of the country is much more encouraging than at any time since the panic last October. The improvement noted last week has been followed by sales aggregating 70,000 tons of pig iron by a large southern interest, 5,000 tons of basic at St. Louis, 6,000 tons to pipe interests in the east, 10,000 tons at Milwaukee, 6,000 tons to a Chicago foundry, 4,000 tons at Moline, Ill., and many smaller sales. Inquiries for malleable, basic and No. 2 foundry have been received in large volume, and the feeling in the trade is distinctly better. A noteworthy feature of the new conditions is the eagerness of brokers to place orders, many of them evidently coming to the conclusion that bottom prices have been reached. It is, of course, impossible to predict whether the improvement will continue. Many inquiries have, no doubt, been sent out to test prices, but the market has, for the most part, stood the tests very well. While it is probably true that some southern iron has been sold on analysis closely approximating No. 2 foundry at $11 Birmingham, the market now appears to be firm at $11.50. Owing to the fact that heavy stocks of iron have been sold and that interests which usually make low quotations are well supplied with orders, there seems to be little prospect of prices in the south declining. In the north, there is still some unsteadiness, but prices are firmer than they were a week ago, and furnaces are not inclined to sell for last half delivery on the present level.

Improvement in Coke

New life has also come to the coke market. A Pittsburg interest has sold 30,000 tons of foundry coke for 11 months delivery, beginning June 1. An inquiry for 30,000 tons of furnace coke from a Wisconsin company is about to be closed. The leading steel foundry interest is in the market for its requirements of foundry coke, and many other buyers have also sent out inquiries.

Structural Material

Sales of structural material have been confined largely to the Chicago district, where some 16,000 tons, including the LaSalle hotel tonnage heretofore mentioned, have been sold within 10 days. Leading sales of the week were 3,200 tons for an Anaconda smelter; 1,300 tons for the court house at Duluth; 1,000 tons for a building at Kansas City; 1,500 tons for a Birmingham building, and 2,800 tons for two New York buildings. Two large independent steel concerns which have heretofore sold to fabricators have entered the market for contracts direct.

Cast Iron Pipe Sales

Cast iron pipe contracts include 6,400 tons for Detroit taken by the Dimmick Pipe Co., and Syracuse, N. Y., is expected to contract for 20,000 tons at an early date, in addition to the 10,000 tons recently purchased. The Michigan Central railroad has contracted for 10,000 kegs of spikes and 500 tons of bolts. Sales of rails have not been heavy.

Finished Material

Taken as a whole, the finished material market is very quiet, but there is no expectation that prices will be changed at the New York meeting this week. If there should be any change, it would probably be in billets, as the spread between the pig iron and crude steel is admitted to be too large.

OPTIMISM PREVAILS

At Machine Tool Makers' Conventions—Costs Discussed.

(Special Telegram.)

Atlantic City, N. J., May 19.—Fifty representative machine tool manufacturers, members of the National Machine Tool Builders' Association, met at the Hotel Chalfonte, Tuesday for their semi-annual convention. They were for the most part optimistic as to the trade outlook and expect a gradual restoration of normal conditions, with the passing of disturbing political events. Conversation with most of the members before the meeting developed the fact that there is a practically unanimous feeling that no price reductions will be made, and that cost schedules are such as not only to render the maintenance of present prices practically certain, but also to indicate an early advance in certain lines.

The association recorded another distinct advance in its educational work in the adoption of a uniform cost accounting system, the result of several years' investigation.

The opening session of the convention was the occasion for several reports. That of President Eberhardt expressed the opinion that the worst of the depression is passed and, with the clearing of the political horizon, normal business condition will return. No appreciable amount of new permanent business, he believed, could have been created by a reaction in prices, even if the margin of profit had been large enough to warrant it. He recommended a broadening of the constitution to admit to membership certain additional machine tool manufacturers whose interests are identical with those of the association. In particular, he referred to the great moral steadying influence or business in times of depression of the action of individual manufacturers of high-priced products in refusing to meet the competition of lower-priced products at the sacrifice of reasonable profits based on true costs. He touched upon the report of the costs committee, and finally urged the annual election of an arbitration committee to consider differences between different manufacturers though recommending that recourse be had to this only in extreme cases.

The report of P. E. Montanus, secretary, shows that the association's finan-

(Continued on page 922.)

THE WEEK IN IRON CENTERS

PITTSBURG.

Continued Increase of Inquiries and More Sales of Pig Iron Made.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., May 19.

A revival of buying interest in pig iron has featured the iron and steel situation of the past week. Inquiries of so large a tonnage, by comparison, and of so general a character have appeared as to afford the belief to furnacemen that the turn in the market, as respects pig iron, has come. Buyers also appear to be approaching a conviction that present prices are close to the bottom and that their best interests demand their taking advantage of existing conditions.

The tonnage actually placed under contract, however, has not been of significant proportions as yet, and will likely not be for a week or more or until present negotiations have determined the degree of genuineness in the present inquiries. Then it may be more accurately gaged whether the rejuvenated market is a mere flurry or a permanent reality. It is not generally thought that business conditions among foundries and iron and steel mills have improved to such an extent as to wholly justify, in themselves, a general buying movement of large proportions at this time. The belief is held, however, that many companies which have been buying their pig iron almost from week to week in accordance with their actual needs, have reached the conclusion that they must now act to gain the advantage of the prevailing quotations for their future operations. In accord with this view, some companies in favorable financial positions are buying not only pig iron but old material with intentions of piling it in their yards to await future consumption when normal business conditions shall have have been re-established.

Whatever may be the basis upon which the quickened demand is placed, there is much encouragement to be found in the development and there has been a perceptible brightening of spirits among pig iron makers. With pig iron in a more stable position, dependent lines, notably the castings industry, are expected to improve and the influence to work toward better conditions, generally, in iron and steel.

Arising from the better tone in pig iron, the iron and steel trade, as a whole, is displaying a more cheerful sentiment. The market however, is practically unchanged and is moving along quietly from week to week with no immediate prospects for a restoration to a normal basis.

Pig Iron.—A continuance, in a decided manner, of the renewed interest in pig iron noted the preceding week and based apparently upon the spreading conviction that prices have reached the low mark, was in evidence the past week. Inquiries for all grades of iron have come out during the past few days with encouraging regularity and there is now under negotiation a larger tonnage, undoubtedly, than has been at any time since the decline of business conditions. It is conservatively estimated that prospective buyers are now asking figures from local sellers on upwards of 100,000 tons, basic predominating, the greater portion of which has come upon the market in the past week. Among the principal inquiries for basic, are those of the American Steel Foundries, American Car & Foundry Co., Scullin-Gallagher Iron & Steel Co., and the Commonwealth Steel Co., the latter for from 10,000 to 20,000 tons. There was some buying in the week on these inquiries, notably 2,500 tons of basic, which will be furnished by Virginia furnaces. Sales, generally speaking, have been larger in the week than for months, in accordance with the increased interest, but negotiations have not been advanced as yet to the point that will clearly define the bona fide prospects from the mere "feelers."

At this moment, the question of deliveries is largely entering into the situation, furnaces as a rule, asking 50 cents over present prices for delivery beyond July and August. Some interests are showing less inclination to sell at the $14.50 valley basis, asking $14.75, but iron is available at the lower figure and we note the sale of several small-sized lots for prompt delivery at $14.50 and $14.60 valley. Reports that iron may be had under these figures are not supported by known transactions. A sale of 350 tons of No. 1 foundry brought $16 Pittsburg or $15.10 valley. Basic iron is being quoted at from $15 to $15.50 valley furnace, but as the production is in the hands of comparatively few interests, the lower price seems not likely to be long held in the face of an aggressive buying movement for extended deliveries. Bessemer is from $16 to $16.50 valley, with $17 asked for chill-cast, malleable from $14.75 to $15.25 and gray forge, $14 valley. The Pittsburg territory, which is largely a consumer of steel-making iron, has not produced much of the present inquiry, but some of the large buyers are now carefully scanning the market.

Southern iron has been established squarely upon an $11.50 Birmingham basis for No. 2, the larger companies having made this price for all brands and it is reported that a substantial tonnage was taken this week. We note the sale of 1,200 tons of Nos. 2, 3 and 4 to a northern Ohio cast iron pipe maker and some smaller tonnages at the prevailing quotations. There is one inquiry in the market by an Ohio melter for a large tonnage of southern iron.

On prompt and second quarter delivery on northern iron, the higher quotation on Bessemer being for chill-cast, we quote as follows:

Bessemer, valley	$16.00 to 17.00
Bessemer, Pittsburg	16.90 to 17.90
No. 1 foundry, Pittsburg	15.65 to 16.15
No. 2 foundry, Pittsburg	15.40 to 15.65
Gray forge, Pittsburg	14.90 to 15.15
Basic, valley	15.00 to 15.50
Basic, Pittsburg	15.90 to 16.40

Ferro-Manganese.—The gradual stiffening, which has been apparent in the ferro-manganese market for the past four or five weeks, is continuing, and we quote 80 per cent ferro-manganese for prompt and future shipment at from $45.50 to $46 Pittsburg. We note several small sales in the week on this basis. The ferro-silicon market is unchanged.

Imported 50 per cent ferro-silicon is quoted $67 Pittsburg on forward deliveries; domestic 12 per cent, $29; 11 per cent, $28; 10 per cent, $27. The lower grades of imported ferro-silicon are upon about the same basis. These quotations are applicable to Pittsburg territory.

Plates.—The plate market is moving along easily and there are no evidences of substantial improvement. There is a limited consumption going into steel car work, mainly for repair purposes. The material for several lake freighters, which were contracted for recently, is expected to be drawn largely from standing contracts. Several small mills are shading plate prices, and we quote:

Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.70c f. o. b. mill Pittsburg. Extras are as follows per 100 pounds. Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary fire-box steel

plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive fire-box steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—A slight improvement in both galvanized and black sheets is noted, but this is not of sufficient extent to make any material change in the mill operations of the leading interest or of independents. The percentage of activity continues about 50 per cent. There is shading of prices by some small mills. There is a fair business in corrugated iron sheets. We quote:

Black steel sheets, one pass, cold rolled: Nos. 11-12, 2.10c; Nos. 13-14, 2.15c; Nos. 15-16, 2.20c; Nos. 17-21, 2.25c; Nos. 22-24, 2.30c; Nos. 25-26, 2.35c; No. 27, 2.40c; No. 28, 2.50c; No. 29, 2.60c; No. 30, 2.70c. Galvanized: Nos. 10-11, 2.45c; Nos. 12-14, 2.55c; Nos. 15-16, 2.65c; Nos. 17-21, 2.80c; Nos. 22-24, 2.95c; Nos. 25-26, 3.15c; No. 27, 3.35c; No. 28, 3.55c; No. 29, 3.70c; No. 30, 3.95c. Blue annealed: Nos. 11-12, 1.85c; Nos. 13-14, 1.90c; Nos. 15-16, 2c. Corrugated roofing, $1.75 per square for No. 28 painted, 2½-inch corrugation, and $3.10 per square on galvanized roofing, 2½-inch corrugation, No. 28.

Tin Plate.—Prospects in tin plate continue favorable for a normal operation of mills through a greater portion of the summer. The fruit crop outlook is reported to be good, and other indications for the future are quite encouraging to manufacturers. We quote:

Coke tin plate, 100-pound basis, 14 x 20, $3.70 f. o. b. mill, Pittsburg district. Terms, 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—The rail situation continues as it has been, and outside of a fairly active business in light rails there is no new buying of consequence. Several of the large coal companies in this district have recently come into the market for their annual requirements of light rails aggregating several thousand tons. Re-rollers are naming low prices on light rails as in the past. The railroads continue to refrain from making any extensive contracts on standard spikes. The Michigan Central recently took about 6,000 kegs and the Erie has been figuring upon a fairly large quantity. On present specifications on Bessemer rails we quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $36; 12-pound, $32; 16-pound, $30; 20-pound, $29; 25 to 45-pound, $28; angle splice bars for standard sections, $1.65; standard spikes, $1.70 to $1.80 Pittsburg; hand spikes, $1.80 to $1.90 Pittsburg.

Steel.—The usual report of the past several months is made on crude steel. The billet market lacks any semblance of life. Sheet and tin bars are being taken in large tonnage by the sheet and tin plate mill on existing contracts.

We continue to quote Bessemer and open-hearth billets $28 Pittsburg, and forging billets at $30 Pittsburg, subject to the division of the freight charge over $1 and not exceeding $3, and sheet and tin bars at $29.50 Pittsburg, valley and Wheeling territory, and $29 Pittsburg for delivery to other points.

Hoops, Bands and Cotton Ties.—There is little activity in cotton ties at the present time. In hoops and bands the situation is unchanged, and the market is exceedingly quiet. We continue to quote the following official prices:

Cotton ties, 85c per bundle Pittsburg, plus the freight on lots of 3,000 bundles or more, and 88c per bundle Pittsburg for less than 3,000 bundle lots.

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c; base half extras as per standard steel.

Merchant Bars.—Twisted steel bars, 5/16 to 1¼ inch inclusive, for reinforced concrete construction are being quoted by re-rollers at 1.50c base Pittsburg in carload lots, or 1.60c in less than carload, with no extras for twisting. This is equivalent to about 30c under the official schedule. The bars are being re-rolled from old rails. Low prices are also being made by re-rollers on other steel specialties. The bar situation offers little evidence of change. Steel bar buyers are taking tonnages only for quick delivery and specifications on first half contracts are moderate. The railroads are consuming bar iron very meagerly. Shafting is moving along quietly. We quote:

Common iron bars, 1.50c Pittsburg in carload lots and over; 1.60c in less than carloads; 1.47c to 1.50c base Pittsburg plus freight to point of shipment on western deliveries; Bessemer steel bars, 1.60c; plow and cultivator, 1.60c; channels, angles, zees, tees, under 3 inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 56 per cent in carloads, and 52 per cent in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. Planished and machine straightened tire steel is 1.80c base. Iron finished tire under 1½ by 1½ inches, 1.75c; iron finished tire, 1½ by 1½ inches and over, 1.60c base. All tire subject to ½ extra on the steel card.

On cold rolled strip steel, widths 1½ inch and wider and 0.100 inch and thicker, we quote base prices per 100 pounds, $3.60 on hard and $3.75 on soft.

Structural Material.—Little new inquiry in structural lines has appeared in the week, and the general situation has not changed. Contracts being taken are comparatively few, although there is considerable work being figured upon. Fabricating prices, if anything, are lower, but structural steel is holding absolutely firm. Small order business is making up the greater part of mill rollings. The contract for 1,200 tons for the addition to the Fort Pitt hotel in this city is expected to be placed this week. We quote:

Beams and channels, 15-inch and under, 1.70c; over 15 inches, 1.80c; zees, 1.70c; tees, 1.75c; angles from three to six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.70c base.

Merchant Pipe.—The pipe market is holding its own with some gradual improvement although the progress from week to week is very slow. Jobbers' stocks are low and are not increasing. Purchases from this source are in small quantities, but are being made regularly and frequently for immediate consumption purposes. In line pipe, conditions are promising for some large projects appearing soon. Manufacturers, as a rule are in good spirits and are firmly maintaining present price cards. We continue to quote the following official discounts to consumers in carload lots with an additional one point and five off to jobbers:

	Steel		Iron	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	65	49	63	..
⅜ inch	67	53	65	51
½ inch	69	57	67	55
¾ to 6 inches	73	63	71	61
7 to 12 inches	70	55	68	53
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	58	46	56	44
½ to 4 inches	65	53	63	51
4½ to 8 inches	61	49	59	47
DOUBLE EXTRA STRONG PLAIN ENDS.				
¼ to 8 inches	54	43	52	41

Boiler Tubes.—Trade in boiler tubes is light. The railroads are taking only their actual requirements for maintenance. Prices generally are being upheld. We continue to quote the following discounts:

	Iron.	Steel.
1 to 1½ inch	42	47
1¾ to 2¼ inch	42	59
2½ inch	47	61
2¾ to 5 inch	52	65
6 to 13 inch	42	59

2¼ inches and smaller, over 18 feet, 10 per cent net extra.

2¾ inches and larger, over 22 feet, 10 per cent net extra.

Wire Products.—The largest hardware distributors in this territory are taking wire and nails in weekly carload installments, and this condition is typical of the wire trade. Jobbers are exercising great caution in specifying or buying, and stocks are reported to be low. The volume of trade is not increasing, but the usual activity which came with the spring season is being prolonged. Prices are unchanged and we quote:

Wire nails, jobbers' carload lots, $2.05; retailers' carload lots, $2.10; less than carloads, $2.15; painted barb wire, $2.20 for jobbers in carloads; retailers in carloads, $2.25; and less than carloads, $2.35, with 30c for galvanizing; plain wire, 1.90c for jobbers, and 1.95c by carload.

Wire Rods.—No developments of note are reported in wire rods, and we quote $35 Pittsburg on Bessemer and $36 Pittsburg on open-hearth.

Coke.—A Pittsburg interest in the week sold 30,000 tons of Connellsville foundry coke to a large manufacturer for 11 months' delivery beginning June 1. The price was not made public. This is an unusually large transaction in foundry coke and has produced a good sentimental effect upon the market. There are also some large furnace coke inquiries under negotiation. The coke market, in general has a better tone and there is more buying for delivery over the remainder of the year, particularly in foundry grades. Shipments on suspended contracts are also better. The H. C. Frick Coke Co. put in blast this week about 1,000 additional ovens, making about 1,500 started in the past two weeks. There is little change as to operations among the independents. Prices are the same and we quote standard Connellsville foundry coke at from $2 to $2.25 ovens, the latter figure for extended deliveries and standard Connellsville furnace coke at from $1.65 to $1.75 ovens. *The Courier* for the week ending May 9 reports 14,665 active ovens and a production of 173,045 tons corresponding to 14,065 active ovens and 166,175 tons the preceding week.

Old Material.—Barring a little flurry in the week caused by some buying of low phosphorus scrap in this territory by a steel foundry interest, the situation in old material has not changed. A very dull state prevails. It is understood the steel foundry company bought the material believing it a good investment at the prevailing prices and will pile it in its yards until renewed business activity warrants its consumption. Prices, which are largely nominal, are unchanged and we quote:

Heavy melting scrap, $12.50 to $13; re-rolling rails, $14 to $14.25; bundled sheet scrap, $8.50 to $9; iron axles, $18.50 to $19.50; old iron rails, $15 to $16; No. 1 wrought scrap, $13.25 to $13.75; old car wheels, $13 to $13.50; low phosphorus scrap, $15.50 to $16; machine shop turnings, $8 to $8.50; cast borings, $7.25 to $7.75; No. 1 cast scrap, $14 to $14.50.

CHICAGO.

Heavy Sales of Pig Iron and Structural Material—Coke More Active.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, May 19.

The large sales of southern pig iron by the Sloss-Sheffield Steel & Iron Co., aggregating 70,000 tons of which about 25,000 tons was sold in this territory alone, were the features of first importance in the market events of the week followed closely in interest by the placing of over 16,000 tons of structural steel contracts. In addition to the activity of the one interest, an additional 10,000 tons of iron, the greater part northern iron, was purchased. The ruling price of southern iron, now $11.50 Birmingham for No. 2, seems to be more firmly established than for some time. Interest in coke has also featured the week and certain large melters are on the eve of closing for their requirements over more or less extended periods. The remainder of the market, involving for the most part the various crude and finished forms of steel, evidenced a pronounced dullness so far as transactions were concerned, but a clearly discernible expectation of important action at the New York conference was everywhere encountered.

Pig Iron.—The pig iron situation from the standpoint of southern irons is distinctly stronger and firmer now than a week ago. This is due almost entirely to the sale of about 70,000 tons by the Sloss-Sheffield interest of which about 25,000 tons was sold in Chicago territory. This iron was sold on a quick offer and although it is understood that a distinct concession from the market was made, there is no evidence that the price was as low as the lowest prices which have been rumored and this opinion is strengthened by the fact that the iron was sold by analysis. The price in this market last week was clearly $11.50 with a tendency toward lower prices because of the large stock known to be held by the Sloss-Sheffield interest, and because of the fact that large inquiries were in the market which could be developed into orders without much of a concession and a general lack of certainty regarding just how much pressure the furnaces would stand at the $11.50 price. This week the price is again $11.50 for all of the southern interests with the possible exception of the Republc Iron & Steel Co., which is not making an open quotation of $11.50, but in the meantime the market has been tested, there has been a considerable tonnage taken off the hands of the producers, the consumers know how much iron they could get at the low price and the producers know more about the eagerness and feelings of the consumers in the matter of buying at the present levels. For these reasons the evidence points to a more firmly established status at the present than has existed since the similar situation in January, when a large tonnage was sold at $12. It is not apparent where any standard No. 2 southern iron can be bought at this writing at less than $11.50 Birmingham. With Woodward furnaces filled up on standard foundry irons until some time in August, with the Republic Iron & Steel Co. at the top of the market, content to remain there without taking any large business and without heavy stocks of iron piled, with Sloss-Sheffield relieved of a good portion of the burden it has been carrying, with Alabama Consolidated, of conservative resources and making a high grade iron, with most of the other southern Tennessee and Virginia stacks out of this market for one reason or another, there remains only the Tennessee Coal Iron & Railroad Co. to take immediate future concessions. So far this interest has shown no actual intent to underbid the market, and it is unlikely to as-

sume that it will. The melting of iron has not increased materially, however, and the purchases already made or in contemplation are on behalf of larger interests anticipating the future and seeking to buy in quantity at the bottom. If conditions fail to develop in the last half and the present position of the furnaces is weakened by another long period of few orders, the price may ease off a fraction of a dollar.

In addition to the large sales mentioned, the Northwestern Iron Co. sold some 6,000 tons and it is also understood that this interest is figuring on another tonnage arrangement with an implement interest similar to that which it is now filling, involving a considerable tonnage. A fair volume of southern iron was sold in lots up to 1,000 tons, including some silvery iron. An estimate of the total tonnage sold in this market last week would reach 35,000 tons, not including the 10,000 tons of basic, the purchase of which was announced in the THE IRON TRADE REVIEW last week. Among the purchases reported were 10,000 tons by Allis-Chalmers, half of which was northern and half southern iron, 6,000 tons by the Featherstone Foundry & Machine Co., a little less than 4,000 tons by Moline interests, 1,000 tons by the Fred M. Prescott Steam Pump Co., and a round tonnage by the L. Wolff Mfg. Co., Chicago. The demand for northern irons was about as it has been and without special feature. We quote for Chicago delivery as follows:

Lake Superior Charcoal	$20.00 to 20.50
Northern Foundry No. 1	17.50 to 18.00
Northern Foundry No. 2	17.00 to 17.50
Northern Foundry No. 3	16.50 to 17.00
Southern Foundry No. 1	16.35 to 16.85
Southern Foundry No. 2	15.85
Southern Foundry No. 3	15.85 to 16.35
Southern Foundry No. 4	15.35 to 15.85
Southern No. 1 Soft	16.35 to 16.85
Southern No. 2 Soft	15.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Southern Silveries, 4 per cent Silicon	17.85 to 18.35
Southern Silveries, 5 per cent Silicon	18.35 to 18.85
Southern Silveries, 6 per cent Silicon	19.35 to 19.85
Jackson Co. Silveries, 6 per cent	18.90 to 19.40
Jackson Co. Silveries, 8 per cent	20.90 to 21.40
Jackson Co. Silveries, 10 per cent	22.90 to 23.40
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	18.25 to 18.75
Alabama Basic	17.35 to 17.85

Billets and Rods.—An inquiry for a carload lot of billets is a curiosity in this market and with the exception of the billets rolled by the Wisconsin Steel Co. for the leading implement manufacturer, the billet mills in this territory are without orders. There is no change in the wire rod situation. We quote for Chicago delivery, rolling billets, $29.50; forging billets, $31.50. Wire rods continue at $35 for Bessemer, $36 for open-hearth, and for chain rods, $37, all f. o. b. Pittsburg.

Merchant Bars.—There is less initiative in the market for bar iron at present and May is offering fewer encouraging symptoms in this particular direction than did April. Nearly all the bars being moved are on contracts taken at $1.55, Chicago, and very little new business is offered at any price. The price of steel bars is well maintained though the volume of tonnage is practically nil. The demand for merchant steel in its various forms is limited and weather conditions are augmenting the backwardness of the agricultural demand. We quote as follows:

Bar iron, 1.65c to 1.68c; soft steel bars and bands, 1.78c, half extras; soft steel angles, less than 3 x 3, 1.88c; hoops, 2.18c base, full extras; planished or smooth finished tire steel, 1.98c; iron finish, up to 1½ x ½ inch, 1.93c base tire card; iron finish, 1½ x ½ inch and larger, 1.78c base, steel card; channel for solid rubber tire, ¾ to 1 inch, 2.28c, and 1⅛ inch and larger, 2.18c; smooth finished machinery steel, 2.18c; flat sleigh shoe 1.83c; concave and convex sleigh shoe, 1.93c; cutter shoe, 2.36½c; toe calk steel, 2.33c; railway spring, 1.98c; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 56 per cent off the list for carload lots, and 52 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 2.10c, full extras; soft steel bars, $2 per 100 pounds base, plus half extras; soft steel hoops, 2.40c; full extras.

Plates.—Whatever transactions have been made in steel plates have been too small to warrant mention and with the possible exception of material for two new lake boats the future is without indications of probable orders. We quote:

Plates, ¼ inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.88c to 1.91c Chicago. For extras see Pittsburg report. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼ inch and heavier, up to 72 inches wide, 2.10c to 2.20c; from 72 to 96 inches wide, 2.20c to 2.30c; 3/16 inch up to and including 60 inches wide, 2.20c to 2.25c; 72 inches wide, 2.45c to 2.55c; No. 8, up to 60 inches wide, 2.20c to 2.25c. Flange and head quality, 25c extra.

Sheets.—The activity in sheets has proven to be short lived and at present there is little evidence of animation. Prices from store are without change and we quote as follows: (For mill prices see Pittsburg report.)

No. 10, 2.20c to 2.25c; No. 12, 2.25c to 2.30c; No. 14, 2.30c to 2.35c; No. 16, 2.40c to 2.50c; Nos. 18-20, 2.60c to 2.65c; Nos. 22-24, 2.65c to 2.70c; No. 26, 2.70c to 2.75c; No. 27, 2.75c to 2.80c; No. 28, 2.85c to 2.95c; No. 30, 3.25c. Galvanized sheets, Nos. 10 to 16, 3.05c to 3.15c; Nos. 18 to 20, 3.15c to 3.25c; Nos. 22 to 24, 3.30c to 3.35c; No. 26, 3.50c to 3.55c; No. 27, 3.70c to 3.75c; No. 28, 3.90c to 4.00c; No. 30, 4.40c to 4.50c.

Structural Steel.—On the eve of the New York meeting it is at least interesting to note the tonnage of structural contracts being placed. In the Chicago territory in the last week, including the LaSalle hotel tonnage there was placed a little over 16,000 tons. Next to the hotel project, which calls for 7,000 tons to be furnished by the American Bridge Co., is the contract for 3,215 tons for the Anaconda smelter, taken by Jones & Laughlin. The Brown Ketchum Iron Works, Indianapolis, took contracts for 2,400 tons, including 1,367 tons for the court house at Duluth and 1,038 tons for the Loose Wiles building in Kansas City. A court house for Carbon county, Utah, requiring 50 tons, was taken by the Minneapolis Steel & Machinery Co., and a building for the Metropolitan Life Insurance Co. at San Francisco was contracted for, the steel, amounting to 80 tons, to be furnished by Dyer Bros. of that city. The American Bridge Co. took orders for 244 tons for the Graff building in San Francisco, 250 tons for the Paris Millinery building at Salt Lake City, and 160 tons for a railroad trestle at the Rust mine at Hibbing, Minn., for the Duluth, Missabe & Northern railroad. The Chicago, Indianapolis & Louisville placed its order for 450 tons of bridge structurals with the Wisconsin Bridge Co., and the Chicago, Burlington & Quincy ordered 188 tons from Penn Steel Co. Two new banks at Youngstown, O., calling for 303 tons were placed, as was also the Armory at Seattle, Wash. This last contract was taken by the Puget Sound Building Co. and the tonnage was 121. The Brown-Marx building at Birmingham, which has been mentioned previously, was let, and the steel, amounting to about 1,500 tons will be supplied by the American Bridge Co. Other projects are in sight, an early placement of which is anticipated and inquiry for estimates is active. Among these is one for 1,000 tons of pipe for the Bit-

ter Root Valley Irrigation Co.'s project at Hamilton, Mont. This company is the successor to the Bitter Root District Irrigation Co., to whom was reported last August the sale of 1,000 tons of pipe by the American Bridge Co. It is not known as yet whether this inquiry for new pipe will be filled or whether the new company will obtain the old pipe which was not delivered to its predecessor, when that company was taken in charge by the receiver. Prices remain unchanged, though some of the above contracts were placed at very low figures for the erected material. We quote:

Beams and channels, 3 to 15 inches inclusive, 1.88c to 1.91c delivered Chicago. For extras see Pittsburg report. Quotations from store are as follows for carload lots and over:

All angles, 3 inches and larger, including 6 inches, $2.05 per 100 pounds; angles, over 6 inches, $2.15 per 100 pounds, base; beams, 3 to 15 inches inclusive, $2.05 per 100 pounds, base; channels, 3 inches and larger, $2.05 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—The placing of orders for a part of the balance of the New York Central lines track fastenings requirements and the sale of a fair tonnage of light rails were the only happenings of interest in the rail situation. The further requirements received, covered 12,000 kegs of spikes for the Michigan Central and 500 kegs of bolts. Prices remain as a week ago and we quote as follows:

Standard rails, $28 f. o. b. mill, full freight to destination; light rails, 25-pound to 45-pound, $28; 20-pound, $29; 16-pound, $30; 12-pound, $31. Track supplies, f. o. b. Joliet, angle bars, 1.50c in carload lots; spikes, 1.80c to 1.90c; track bolts, with square nuts, 2.30c to 2.40c; with hexagon nuts, 2.45c to 2.50c. Small railroad and square boat spikes, 1.90c base, f. o. b. Pittsburg.

Merchant Pipe and Boiler Tubes.—The trade in tubular material is without feature in any of its branches. There has not been the development of demand that was anticipated and the attitude of all concerned may be expressed as a "waiting for something to happen." We quote prices unchanged.

We quote mill discounts, Chicago delivery, carload lots, as below. On steel pipe jobbers are allowed a concession of one point and 5 per cent additional from the schedule in force.

	—Steel—	
	Black.	Galv.
¼ to 6 inches, inclusive....	71.2	61.2

BOILER TUBES.

	Steel.	Iron.	Seamless.
2¼ to 5 ins., inclusive..	63.2	50.2	49.2

Mill quotations on iron pipe are five points higher than the foregoing prices.

We quote prices from store unchanged, as below. A concession of one-half to one point from these prices is allowed by Chicago jobbers on carload orders shipped from local stocks. We quote for less than carload lots as follows:

MERCHANT PIPE.

	Black.	Galv.
⅛ to ¼ inch.....	64	48
⅜ inch	66	52
½ inch	68	56
¾ to 6 inches.....	71	62
7 to 12 inches.....	68	53

Store prices for wrought iron pipe, carload lots, from Chicago stocks, are as follows: One-eighth to ¼ inch, 59; ⅜-inch, 61; ½-inch, 63; ¾ inch to 6 inches, 68; 7 inches to 12 inches, 65. Boiler tubes from store are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	35	35	35
1¾ to 2¼ inches.....	50	35	35
2½ inches	52½	35	35
2¾ to 5 inches.....	60	47½	47½
6 inches and larger.....	50	35	..

Cast Iron Pipe.—Contracts at Dayton and Columbus, O., were placed with the United States Cast Iron Pipe & Foundry Co., the former being for 500 tons and the latter for 600. Council Bluffs, Ia., is fostering a project for a new waterworks system that will require 7,000 tons of pipe. The tonnage at Milan, Mich., mentioned last week, was awarded to Contractor Stone, of Lima, O. Prices remain as a week ago, and we quote: 4 to 6-inch pipe, $27; 6 to 16-inch, $26; larger sizes, $25; gas pipe $1 a ton higher.

Wire Products.—The sale of wire products is holding up fairly well, particularly as regards barb wire. The impassibility of roads and the condition of the farm land as a result of the heavy rains is an unfortunate feature of the situation. We quote as follows:

Wire nails, $2.23; painted barb wire, $2.38; galvanized barb wire, $2.68; smooth annealed wire, $2.08; smooth galvanized wire, $2.38; polished staples, $2.23; galvanized staples, $2.63. Carload lots to retailers, 5 cents higher; less than carload lots, 15 cents higher.

Coke.—While the general run of coke trade in this territory is unchanged in its activity, some of the larger buyers are engaging considerable tonnages. The Wisconsin Steel Co., which bought 10,000 tons recently, is planning to blow in another blast furnace and is reported to be figuring on the purchase of 30,000 tons of furnace coke. It is also understood that another large interest has made a contract for a round tonnage of foundry coke. The American Steel Foundries is in the market for a part of its requirements of foundry coke, but the tonnage is not given out. Contract prices on large tonnages are close to $2 for standard Connellsville foundry coke, at the ovens and something below $1.60 for furnace coke. In carload lots foundry coke is selling at $2.25 and furnace coke from $1.60 to $1.75.

Old Material.—With the absorption of the tonnage offered last week by the railroads and the continued lack of anything like proportionate demand on the part of consumers the scrap situation is undoubtedly weaker. The week was uneventful. An effort is being made as described elsewhere in this issue to standardize the classification of scrap for all the railroads of the country. We have revised our prices and quote as follows gross tons in the first paragraph:

Old car wheels	12.50 to 13.00
Old iron rails	14.75 to 15.25
Re-rolling rails (3 ft. and over)...	13.00 to 13.25
Old steel rails (3 ft. and under)	12.00 to 12.50
Light section relayers, 45 lbs. and under, subject to inspection....	21.00 to 23.00
Relaying rails, subject to inspection	19.00 to 19.50
Frogs, switches and guards.....	11.50 to 12.00
Heavy melting steel.....	11.00 to 11.50

We quote, net tons, as follows:

No. 1 R. R. wrought.....	$11.00 to 11.50
No. 2 R. R. wrought.....	10.00 to 10.50
Knuckles, couplers and springs..	10.50 to 11.00
Shafting	14.00 to 14.50
Iron car axles	15.75 to 16.25
Steel car axles.....	15.00 to 15.50
Dealers' forge No. 1.....	9.00 to 9.50
Pipes and flues.....	7.50 to 8.00
No. 1 cast, 150 lbs. and less....	11.50 to 12.00
No. 1 mill.....	6.75 to 7.25
Mixed busheling (Nos. 1 and 2).	6.50 to 7.00
Country sheet	5.25 to 5.75
No. 1 boiler cut.....	7.00 to 7.50
Boiler punchings	10.00 to 10.50
Cast borings	4.00 to 4.50
Mixed borings, etc.....	4.00 to 4.50
Machine shop turnings.....	5.00 to 5.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.50 to 10.00
Stove plate and light cast scrap..	9.75 to 10.25
Old iron splice bars.....	13.00 to 13.50

CLEVELAND.

First Ore Arrives—Increased Inquiry for Pig Iron.

Office of THE IRON TRADE REVIEW,
Browning Bldg., May 19.

Iron Ore.—The first cargo of iron ore received at Lake Erie ports was brought by the steamer G. Watson French, Monday, May 18, being a cargo of 5,731 tons. No more cargoes are expected until next week. The tonnage received at Lake Erie ports will be extremely light. It is estimated that there are now in furnace yards from 9,000,000 to 11,000,000 tons of ore. Including the ore on docks and in furnace yards, a conservative estimate has placed the tonnage at 15,-

000,000 tons. No additional sales of consequence have been made, although it is evident that some furnaces will soon be compelled to come into the market. On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $5; Mesabi Bessemer, $4.75; old range non-Bessemer, $4.20, and Mesabi non-Bessemer, $4.

Pig Iron.—A very marked change in sentiment has taken place in the pig iron market. Although no large sales have been made in this district, many inquiries are pending and numerous small sales are reported. Some southern interests which had been holding for $12, Birmingham, for No. 2, have reduced their quotation to $11.50, but prices of the northern product have not been lowered. While the usual quotation is still $14.50 valley for No. 2, we note the sale of 100 tons of No. 1 at $16, Cleveland furnace, and another lot of 600 tons of No. 2 at $16 Cleveland furnace, for shipment outside of the city. Other sales were made at lower figures. Brokers are evidently convinced that bottom prices have been reached, and are endeavoring to buy. Furnaces are not showing much disposition to sell for the last half of the year at current prices. For Cleveland delivery we quote as follows:

Bessemer	$16.90 to 17.10
No. 1 foundry	15.60 to 15.75
No. 2 foundry	15.40 to 15.50
No. 3 foundry	15.00 to 15.25
No. 2 southern	15.85 to 16.00
Gray forge	14.00 to 14.50
Lake Superior charcoal	20.00 to 20.50

Coke.—There has been increased inquiry for foundry coke, and some fair sales have been made, but there is little activity in furnace coke. We quote $1.55 to $1.65 at the ovens for furnace coke, and $2 to $2.15 for high grade foundry coke.

Finished Material.—A traction line of 74 miles has been financed, and will soon be in the market for steel rails. One sale of 500 tons of 70-pound rails was made, and some other inquiries are pending. Specifications on plates and shapes have been coming in more freely than in recent weeks, but, on the whole, the finished material market shows little change.

Old Material.—The dullness which has characterized the market for several months has not lifted materially in most lines, although there seems to be more strength in steel material prices at this time. Lists of railroad material of all descriptions have closed, the buyers taking some fair tonnages, but consumers seem to be backward in specifying on old contracts. Without a change from last week we continue to quote f. o. b. Cleveland, prices almost altogether nominal, as follows:

Old iron rails	$14.50 to 15.00
Old steel rails (re-rolling)	12.50 to 13.00
Old steel rails (under 6 ft.)	12.00 to 12.50
Old car wheels	12.50 to 13.00
Old steel boiler plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Malleable iron (railroad)	12.00 to 12.50
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	11.00 to 11.50
Country mixed steel	10.00 to 10.50
Low phosphorus	13.00 to 13.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.50 to 12.00
No. 1 busheling	9.50 to 10.00
No. 1 machine cast	11.00 to 12.00
Iron axles	16.00 to 17.00
Axle turnings	7.00 to 7.50
Machine shop turnings	5.50 to 6.00
Grate bars	9.00 to 10.00
Pipes and flues	9.00 to 10.00
Tank iron	8.25 to 9.25
Hoop and band iron	5.25 to 6.25
Sheet iron	4.25 to 5.25
Wrought drillings	5.50 to 6.00
Stove plate	9.50 to 10.00
Cast borings	4.50 to 5.50

NEW YORK.

Improvement in Pig Iron Sales and Inquiries—Better Feeling.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., May 19.

Pig Iron.—There is a decided improvement in tangible business and the situation is steadily taking on a better tone. Many consumers are considering the question of filling their requirements through the entire last half and the number of inquiries now current has increased to such an extent as to indicate an early buying movement of considerable proportions. Pipe interests are prominent in the market just now, one sale of 6,000 tons and another of 1,000 to manufacturers of this class being reported. An Ohio furnace has sold several lots of good size at about $17.75 for No. 2 foundry delivered to New England points. Certain southern interests are making a price of $11.50, Birmingham, on important tonnages, while others in the same field are obtaining 25 to 50 cents higher, the grade of iron being a matter of considerable importance. One southern interest is reported on good authority to have disposed of 60,000 tons and a valley interest reports inquiries aggregating 30,000 tons. The price level remains practically stationary. Rather than lower this figure, several eastern stacks have let it be understood that they will blow out, and there is little prospect of an increase in production at an early date. We quote, tidewater prices, New York City, as follows:

Northern foundry No. 1	$17.50 to 18.00
No. 2X foundry	17.00 to 17.50
No. 2 plain	16.50 to 17.00
No. 2 southern foundry	15.75 to 16.25
Malleable	17.00 to 17.50
Basic	16.75 to 17.25
Gray forge	16.50 to 17.00

Ferro - Manganese.—Heavy selling during the past week has had the effect of strengthening the market to a considerable extent and $43.50, seaboard, is probably the best price that can be secured for prompt delivery. An Ohio steel interest has taken 900 tons for delivery running through the year, at a price understood to have been $43, seaboard, and a New York state interest has purchased 1,200 tons for shipment during the first four months of next year. Sales of the past week have aggregated about 4,000 tons and certain importers are now well sold up.

Finished Material.—An important development of the week has been the action of two large independent steel concerns in abandoning their past policy of selling to fabricators and in entering the market for contracts direct. The contracts for the Brooklyn subway extension have not yet been let and consequently nothing definite has been done in connection with the steel required. It is reported that the tonnage involved in the Great Falls smelter proposition, the contract for which has been taken by the Jones & Laughlin Steel Co., has been increased to 3,500. The Marx building, 1,700 tons, has been taken by the American Bridge Co., and the Lozier building, 1,100 tons, by a local concern. The Scranton shops of the Lackawanna will be let before the end of the week, but a number of other pending propositions have been postponed. Railroads are buying somewhat more actively, though rail sales have been few since the announcement by the Lackawanna Steel Co. of contracts for 6,000 tons from the Maine Central, 8,000 for the Boston & Albany, and 6,000 for the Michigan Central.

The low bid on the 2,800 tons of cast iron pipe for New York City was made by Robert Carter, though no award has been announced. Syracuse is expected to be in the market shortly for about 20,000 tons, this in addition to the 10,000 tons recently placed by private interests in that city with the United States Cast Iron Pipe & Foundry Co. There is some other scattered business in sight throughout New York state and the 12,000 tons for Cuba is still pending.

Low prices are obtainable on both iron and steel bars. One small interest is offering steel bars on the basis of 1.45c, Pittsburg, and offers on bar iron have been as low as 1.20c, Pittsburg. A meeting of the Eastern Bar Iron Association is scheduled for Thursday of this week in this city. Other lines manifest little change, and we quote:

Angles, 3 to 6 inches x ¼-inch and heavier, 1.86c; beams, 3 to 15 inches,

1.86c; tees, 3 x ¼-inch and heavier, 1.91c; plates, carloads, tanks, 1.86c; marine boilers, 2.26c; bar iron, 1.56c; soft steel bars, 1.76c; sheets, No. 28, black, 2.66c.

Old Materials.—There is little change in the situation, which continues extremely quiet, with the demand still insignificant. So far as can be learned, only one eastern Pennsylvania mill is running full time. Railway lists of the month went at about the same level as in April. There is some slight activity in heavy melting steel. We quote gross tons, New York delivery, as follows:

Old iron rails	$13.50 to 14.00
Old steel rails, re-rolling	14.00 to 14.50
Relaying rails	20.00 to 21.00
Old car wheels	13.00 to 13.50
Old iron car axles	16.50 to 17.00
Old steel car axles	15.50 to 16.00
Heavy melting steel	10.50 to 11.00
No. 1 railroad wrought	13.00 to 13.50
Iron track scrap	11.50 to 12.00
Wrought pipe	9.00 to 9.50
Cast borings	5.00 to 5.50
Wrought turnings	7.50 to 8.00
Heavy cast scrap	13.00 to 13.50
Railroad malleable	11.00 to 11.50
Stove plate	9.50 to 10.00
Grate bars	9.50 to 10.00

CINCINNATI.

Large Volume of Sales and Heavy Increase in Inquiry.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., May 19.

More interest is manifested in the pig iron market than for several weeks. A number of unconfirmed reports of intended buying are being circulated, but there is more actual inquiry and the volume of sales has been larger. Considerable shopping appears to have been done in the northeastern part of Ohio, and one inquiry for 2,000 tons for last half delivery is still pending in that territory. It is reported that a 15,000-ton inquiry is under negotiation with a view to buying for investment. There is considerable basic and malleable inquiry in St. Louis territory, one large consumer asking for prices on 10,000 tons of basic; and two consumers want an aggregate of 2,000 tons of malleable. An Indiana melter asks for prices on 500 tons of malleable. An eastern consumer has an inquiry in this market for something over 3,000 tons for last half delivery, of analysis iron. There are two inquiries in Ohio for 500 tons each of foundry iron. Scattering sales have been made in this market, mostly of small tonnages, but a few 1,000-ton lots were included; and one sale of 2,500 tons was reported. Buyers are more inclined to invite propositions and instead of showing indifference are asking traveling men to keep them posted. While these elements in the situation argue for improved conditions, there are persistent rumors of $11 prices having been quoted on No. 2 foundry; and $11.50 Birmingham for southern iron is generally quoted by most of the southern producers. The quotation of $11 Birmingham is believed to be based on analysis running from 2 to 2½ per cent silicon, without reference to fracture grading. Buyers appear to be making an earnest effort to convince themselves as to whether the market has reached bottom. In southern Ohio, the furnace interests continue to maintain previous quotations and do not seem inclined to meet southern iron prices. The trade appears to be uncertain as to the effect of the present increase in inquiry as it is not clear whether lower prices may develop in efforts to secure round lot orders and it is also a question whether the iron is for use or investment, as the melt and actual consumption appear to show but slight, if any, improvement; and there are those in the trade who believe that substantial improvement cannot be looked for until the melt increases and the iron is wanted for actual needs. Buyers appear to feel that quotations should be lower for second half delivery than for prompt shipment; and their correspondence indicates that they would expect to have lower quotations than the present market as an inducement to contract for forward delivery. We quote, delivered Cincinnati, for prompt shipment and May and June based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, as follows:

	PER TON
Southern foundry No. 1	$15.25 to 15.75
Southern foundry No. 2	14.75 to 15.25
Southern foundry No. 3	14.25 to 14.75
Southern foundry No. 4	13.75 to 14.25
Southern No. 1 soft	15.25 to 15.75
Southern No. 2 soft	14.75 to 15.25
Southern gray forge	13.50 to 13.75
Northern No. 1 foundry	16.95 to 17.20
Northern No. 2 foundry	16.45 to 16.70
Northern No. 3 foundry	15.95 to 16.20
Northern 8 per cent silicon	19.70 to 20.20

Finished Material.—The jobbing business in finished lines shows improvement and orders from stock for structural and general lines are better than 30 days ago. Prices remain unchanged. Retail orders are filled at the following prices:

Iron and steel bars, 1.85c to 2c, full extras. Angles, 3 x 3 and over, 2.10c to 2.25c; beams and channels, 15 inches and under, 2.10c to 2.25c; small angles and architectural channels, 2c base; plates, ¼-inch and heavier, 2c; 3/16 inch, 2.10c; No. 8, 2.15c; sheets (blue annealed) No. 10, 2.15c to 2.25c; No. 12, 2.20c to 2.30c; No. 14, 2.25c to 2.35c; No. 16, 2.35c to 2.45c; box annealed sheets, Nos. 18 and 20, 2.55c to 2.65c; Nos. 22 and 24, 2.65c to 2.75c; Nos. 25 and 26, 2.70c to 2.80c; No. 27, 2.75c to 2.85c, and No. 28, 2.85c to 2.95c; boiler tubes, 2¾ to 5 inches, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3c base; cold rolled shafting, 47 to 50 per cent off list; steel tire, 2.05c to 2.10c base.

Coke.—The situation is without material change as to volume of business. Spot coke is irregular and occasional bargain lots are picked up in all districts. Prices for contract coke have not been subject to much testing, but the operators appear to be unwilling to recede from present schedules. Contract prices in the leading coke producing districts are as follows:

	PER TON
Wise county furnace coke	$1.75 to 2.00
Wise county foundry coke	2.10 to 2.25
Pocahontas furnace coke	1.75 to 1.85
Pocahontas foundry coke	2.00 to 2.25
Connellsville furnace coke	1.65 to 1.75
Connellsville foundry coke	2.10 to 2.25

Old Material.—The market appears to be quiet and melters are shopping closely, buying only bargain lots. Quotations are not materially changed, but the undertone seems to be easy. We quote dealers' prices as follows:

Old No. 1 R. R. wrought, net tons	$11.00 to 12.00
Cast machine and fdy., net tons	12.00 to 12.50
Old iron rails, gross tons	16.50 to 17.50
Old steel rails (re-rolling) gross tons	12.50 to 13.00
Old short lengths, gross tons	12.50 to 13.00
Old iron axles, net tons	16.50 to 17.50
Heavy melting scrap, gross tons	12.00 to 12.50
Stove plate, net tons	9.50 to 10.50
Wrought turnings	5.50 to 6.50
Cast borings, net tons	4.50 to 5.50
Car wheels, gross tons	16.50 to 17.50

PHILADELPHIA.

Pig Iron Buyers Are Sounding the Market.

Office of THE IRON TRADE REVIEW,
408 Central Trust Bldg., May 19.

Pig Iron.—Some improvement in demand and inquiries is noticeable since the new basis of prices was reached, but the market must still be called quiet. The fact seems to be that buyers are testing it, to see whether rock bottom has really been reached, and until they satisfy themselves on this point, there is not likely to be any pronounced betterment. From the standpoint of the furnace men the ideas of many consumers as to prices are simply absurd, to put it mildly. Thus, one large steel company announces that it is in the market for 5,000 tons of basic, for which it is willing to pay $14 a ton. According to last accounts the order is still unplaced. Other buyers name anywhere from $15 to $16 a ton as their idea of the proper price for No. 2X foundry. So far as can be learned, no good iron of that grade has been sold for less than $16.75, which is now generally recognized as the new basis. If prices

are firmly held at that figure, which seems to be recognized as fair; considerable new business is expected to develop soon. Indeed it is already coming in some volume for prompt shipment. A Lehigh Valley furnace booked two 1,000-ton orders for forge and mill irons last week, and the pipe founders are still buying, though in reduced quantities. Nearly all orders are for second quarter shipments, with only a little for the third quarter, as there is a general indisposition to sell any distance ahead at the present prices, which are, of course, unremunerative. Production is still being strictly curtailed. The Thomas Iron Co., which last year had nine furnaces in operation, has given orders for the blowing out of its No. 3 furnace this week, leaving only one in operation. In this respect it is about on a par with the Empire Steel & Iron Co., which has one of its eight furnaces in blast. Prices as adjusted to the new basis may be quoted about as follows:

No. 1X foundry	$17.25 to 17.75
No. 2X foundry	16.75 to 17.25
No. 2 plain	16.25 to 16.75
Standard gray forge	15.25 to 15.75
Basic	16.00 to 16.50
Low phosphorus	21.00 to 22.00
No. 2 Birmingham	15.70 to 16.20
No. 2 Virginia	17.00 to 17.50

Finished Material.—There has been no change in the situation, which still waits largely upon the result of the conferences to be held in New York this week. There is a small run of orders for structural material, but in other lines, especially iron bars, the demand is weak. Most of the mills are now down to about one-third of their capacity, and the Schuylkill valley reports duller times than it has seen for a long time. Prices remain unchanged, as follows: Structural material, 1.85c to 2c, according to specifications; steel plates, 1.85c to 1.90c; refined iron bars, 1.45c to 1.55c; steel bars, 1.75c to 1.80c.

Old Material.—Nothing has occurred to change the utter stagnation of the market except slight declines in railroad scrap and stove plates. The mills are buying very little, and the prospect for any immediate activity is not considered bright. Prices show very little change, as follows:

Old steel rails	$14.50 to 15.00
No. 1 steel scrap	12.75 to 13.25
Old steel axles	17.00 to 17.50
Old iron axles	19.50 to 20.00
Old iron rails	16.50 to 17.00
Old car wheels	13.50 to 14.00
Choice scrap R. R. No. 1 wrought	15.00 to 15.50
No. 1 yard scrap	12.00 to 12.50
Machinery scrap	13.50 to 14.00
Low Phosphorus scrap	17.50 to 18.00
Wrought iron pipe	11.00 to 11.50
No. 1 forge fire scrap	10.50 to 11.00
No. 2 forge fire scrap, ordinary	8.50 to 9.00
Wrought turnings	9.50 to 10.00
Axle turnings, heavy	10.50 to 11.00
Cast borings	9.00 to 9.50
Stove plates	10.50 to 11.00

BUFFALO.

Increased Inquiry and Some Good Sales of Pig Iron.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, May 19.

Pig Iron.—There is a greater amount of inquiry current and, while most of it is still for small lots, there are indications of demand for larger volumes. Consequently a decidedly better sentiment pervades the trade. The most noticeable increase in inquiry is for gray forge and malleable Bessemer. The largest asking is for 3,000 tons of foundry grades for the Snow plant of the International Steam Pump Co. Several good sales have been made on a basis of $16 Buffalo for No. 2X. We have revised our schedules to cover the lower prices being quoted. The following are fairly representative, though some interests are still making lower figures:

No. 1X foundry	$16.50 to 17.00
No. 2X foundry	16.00 to 16.50
No. 2 plain	15.50 to 16.00
No. 3 foundry	15.00 to 15.50
Malleable Bessemer	16.30 to 17.30
Gray forge	15.00 to 15.50
Charcoal	21.00 to 21.50

Finished Materials.—The New York State Steel Co. will start its billet mill next week for the purpose of filling an order of 2,000 tons sold in Pittsburg at a price $3 below the prevailing rate and to turn stock on hand into cash. An aggregate of 600 tons of structural is called for in the proposed building of a water tower at Kensington, Buffalo, 150 tons, and of the Stella Niagara convent at Lewistown, 450 tons.

ST. LOUIS.

Large Sale of Basic Stimulates Market—Inquiry for Malleable.

May 19.

Pig Iron.—The purchase of 10,000 tons of basic iron by the American Steel Foundries a week ago for their plants in East St. Louis and Granite City, for delivery over June, July and August, has had a stimulating effect upon the market, and quite a number of smaller contracts for southern iron were placed last week for immediate and future shipment. The purchasers and sellers of the 10,000 tons of basic decline to divulge the price for which it was contracted, but the purchasers are said to be in the market for a still larger tonnage for future shipment. Another sale of basic has been made, being 5,000 tons for delivery during the last half of the year. Buyer's name is not obtainable for publication.

The iron market was further strengthened by inquiries for from 2,500 to 5,000 tons of malleable Bessemer for delivery at the company's plant in East St. Louis, Ill., immediately or over the last half of the year.

The market for southern iron seems to be firm at from $11.50 to $11.75 for No. 2, Birmingham, some of the sellers having withdrawn the price of $11.50 and now quote 25 cents higher for shipment over the third quarter only. Prices for the last quarter are from 25 to 50 cents higher.

Our quotations, f. o. b. Birmingham, to which $3.75 freight has been added, follow:

No. 1 southern	$15.75 to 16.00
No. 2 southern	15.25 to 15.50
No. 3 southern	14.75 to 15.25
No. 4 southern	14.25 to 14.75

Coke.—Shipments of coke came to the St. Louis territory last week at about the same rate as reported for the previous week, and the general tone of the market is better than has been noted for some time, and averages within about 50 per cent of normal. There are no changes noticeable in prices, the best 72-hour Connellsville foundry bringing $2.15 to $2.50, ovens, the higher price for spot shipment and the lower one on contracts.

Connellsville furnace coke is offered at from $1.50 to $2 a ton, f. o. b. ovens, for all shipments. The best Virginia 72-hour foundry coke is quoted at from $2.25 to $2.75, ovens, and furnace coke at $1.75 to $2, ovens. The freight rate from Connellsville and the Virginia fields is $2.80 to East St. Louis, $2.90 to St. Louis, and $2.40 when destined beyond.

Finished Material.—Bids for the construction of the new coliseum, to cost upwards of $300,000, are now in the hands of the building committee. This and other building projects gave some stimulus to the structural iron business in the city last week, although it is freely admitted hat there is not much building on tap. The new coliseum is to be completed by Oct. 1, and will have a seating capacity of 14,000 persons.

A contract also was let last week for the New Cathedral, to be built at Lindell boulevard and Newstead avenue, to be the largest structure of its kind in the United States, costing $2,000,000, to J. E. Robinson & Son, of New York. Plans and specifications drawn by Architects Barnett, Hayes & Barnett provide for the construction of walls which alone will take more than two years to build. The tract upon which the cathedral will be built is 400 feet square.

A deal was closed last week for a new apartment building at Delmar and Lake avenues to cost $200,000, which

will be erected at once; and the Pendleton Investment Co. will soon begin the erection of a $200,000 apartment house at Julian and Hamilton avenues.

Old Material.—The market has not shown any change since last reported, prices remaining as follows:

Cast iron borings, free from foreign material, net ton	$ 4.50
Steel axle turnings, net ton	8.00
Steel railroad axles, net ton	13.50 to 14.00
Iron railroad axles, net ton	15.50
Miscellaneous steel scrap, gross ton	10.25
Old car wheels, gross ton	14.00 to 14.50
No. 1 railroad cast scrap, net ton	11.00
Heavy machinery cast, net ton	12.00
Stove plate and light cast, net ton	10.00
Sheet iron, net ton, uncut	3.50
No. 1 railroad wrought, net ton	10.50 to 11.00
Railroad malleable, net ton	11.50
Heavy melting steel, net ton	10.00

METAL MARKET

NEW YORK.

May 19.

Copper.—Several producing interests are holding electrolytic for 13c and some sales were made on Monday at this figure, indicating a hardening in prices. On a firm market, however, the metal exchange quoted as follows: Lake, 12¾c to 12⅞c; electrolytic, 12⅝c to 12¾c; casting, 12⅜c to 12⅝c.

Pig Tin.—After a week of sharp decline, due chiefly to London bear operations, tin has become more firm and spot metal is quotable at 30.25c to 30.60c, with future delivery slightly lower.

Pig Lead.—The market is stationary at the new level recently reached, 4.22½c to 4.27½c, New York, with a good volume of business.

Spelter.—There is little activity and bidding prices are slightly lower, though asking prices are unchanged. We quote, New York, at 4.55c to 4.65c.

Antimony.—We quote, Cookson's, 8¾c to 9c; Hallett's, 8½c to 8¾c; ordinary brands, 8c to 8¼c.

CHICAGO.

May 19.

The feeling in this market on copper is noticeably stronger, though the volume of business remains but little improved. We quote our minimum price for carload lots, with smaller quantities bringing higher prices. Tin has reacted, following the fluctuations of the week, and lead is holding firmer. We have revised our prices and quote:

Lake copper, 13½c to 14c; casting, 13¼c; pig tin, 32¾c to 33¼c; spelter, 5.10c to 5.25c; pig lead, desilverized, 4.35c to 4.50c in 50-ton lots; corroding, 4.70c to 4.80c in 50-ton lots; car lots, 2½c per 100 pounds higher; sheet zinc, 7c list, f. o. b. LaSalle, in car lots of 600-pound casks; Cookson's antimony, 11c to 11½c; other grades, 10c to 10½c.

There has been no change in the condition of the market for old metals and we quote prices to dealers as follows:

Copper wire, 10½c; heavy copper, 10½c; light copper, 9½c; heavy red brass, 10c; heavy yellow brass, 8c; light brass, 5½c; No. 1 red brass borings, 8½c; No. 1 yellow brass borings, 7½c; brass clippings, 8c; tea lead, 3¼c; lead scrap, 3½c; zinc, 3¼c; tin pipe, 25c; tin foil, 22c; pewter, 17c; electrotype plates, free from wood, 4c; electrotype dross, 2¼c; stereotype plates, 4½c; stereotype dross, 3c; prime slab zinc dross, $62 per ton.

ST. LOUIS.

May 18.

Lead and Zinc.—With an increase in shipments of lead and zinc from the Joplin district last week, lead ore registered a marked advance, a top price of $57 a ton with reports of $57.50. The base price of zinc ore remained at $36 for 60 per cent ore, but the high price on sales was $39, a drop of 50 cents. The base ranged down to $33, and many sales were made at that figure. The lead shipments of last week nearly equalled those of the corresponding week of 1907.

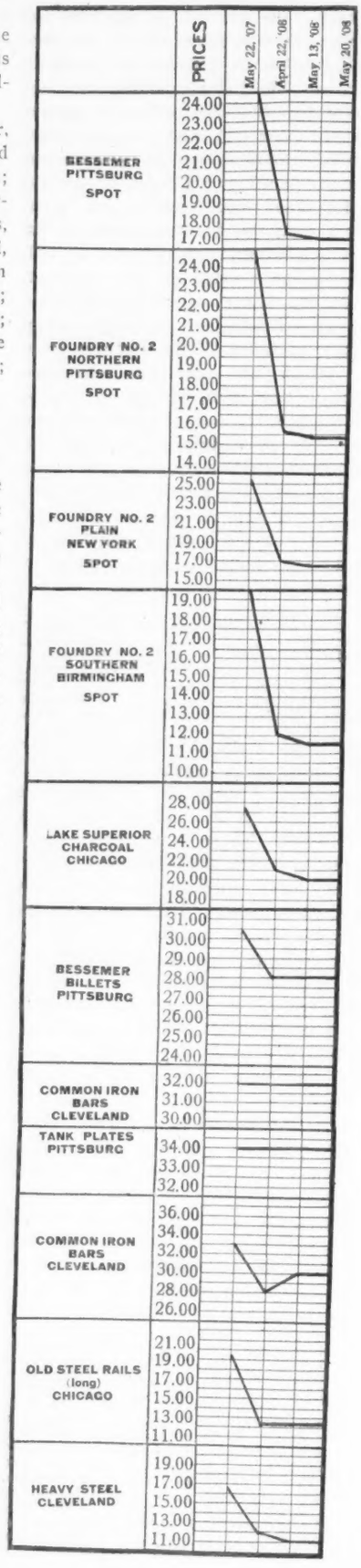
Several days elapsed without rain, thus improving the conditions for output, and nearly all of the mines where operations were not resumed at the close of the week will begin preparations for work at any early date.

The shipments in pounds of lead and zinc ore from the Missouri-Kansas district for the week ending May 16, with their values, follows: Zinc, 9,835,040; value, $166,196. Lead, 1,619,740; value, $44,581.

New President Chosen.—F. A. Coleman was elected president of the J. D. Smith Foundry Supply Co., Cleveland, at a meeting of the directors May 12. Mr. Coleman had been vice president of the company and was chosen to succeed President Frank H. Chamberlin, who died April 10. E. S. Gaylord was elected vice president in succession to Mr. Coleman, and J. S. Smith was chosen secretary and treasurer.

The American Locomotive Co. has received orders for one 6-wheel switching engine for the St. Louis National stock yards, one consolidated engine for the Fajardo Sugar Co., two Mallet type locomotives for the Eastern railway of France, and a large scoop wheel type rotary snow plow for the Paris-Orleans railway.

PRICE CHART.



OBITUARIES.

Arthur Koppel, head and founder of the Arthur Koppel Co., manufacturer of portable and industrial railway material and a corporation of world-wide operations, died suddenly at his home in Berlin, Germany, May 11, at the age of 58 years. Mr. Koppel's achievements in the industrial business world bordered upon the remarkable. Thirty-five years ago, with a small capital, he began his line of manufacture with a modest plant at Bochum in Westfalia, Germany. As the business grew, representatives of the company were sent into the different markets of the world, until today the Arthur Koppel Co. occupies a foremost position in its manufacturing field. At present the company has headquarters at Berlin and 54 branch offices scattered over all the five continents of the globe, and owns and operates three plants in Germany, one in France, one in Russia, one in Spain, one in Austro-Hungary, and one in the United States at Koppel, Pa., near Pittsburg, where a new town named in honor of Mr. Koppel is now under course of construction. Mr. Koppel came to the United States early in 1906 and laid out the plans for the erection of the new works and town. The plant has since been completed and is now in operation. In addition, the company has four branch offices in the United States at Pittsburg, Chicago, New York and San Francisco.

Several years ago the business was re-organized as a stock company, and Arthur Verther and Paul Briske, who had directed their energies in the attainment of the company's success, were admitted as directors. The affairs of the Arthur Koppel Co. will continue in the hands of these latter directors, and the policies of the past will be pursued.

Mr. Koppel was a man of the highest character and integrity, and filled an enviable position in influence and esteem among his fellow countrymen.

John Howard Latham, a director of the Ramapo Iron Works, died May 15 at his home at 16 East Fifty-eighth street, New York.

Walter G. Berg, chief engineer of the Lehigh Valley railroad, died unexpectedly May 21, at his home in New York City, of acute indigestion. He began his railroad career in 1879, as an inspector for the Delaware Bridge Co. He had been connected with the Lehigh Valley road for more than 10 years. Mr. Berg was a member of a number of technical societies, including the American Society of Civil Engineers and the American Society for Testing Materials.

PERSONALS.

T. W. Meachem, president of the New Process Raw Hide Co., Syracuse, N. Y., has been elected president of the chamber of commerce of that city.

Francis B. Reeves has resigned from the vice presidency and directory board of the Lake Superior corporation.

Dr. M. I. Shea has resigned as treasurer of the New England Trolley

ARTHUR KOPPEL.

Wheel Co., Springfield, Mass. Dr Shea's resignation is on account of private business.

M. L. Sternberger, of Jackson, O., has resigned the presidency of the Superior Coal Co., and will go to Europe to recuperate from recent illness. He is also president of the Western Steel & Iron Co.

Francis J. Peck, of the firm of Francis J. Peck & Co., mining engineer and chemist, Cleveland, is examining a mining property in southern Mexico for Cleveland capitalists.

John P. Gates, of Beloit, Wis., has left for Canada, where he has taken the position of chief engineer of the Berlin Machine Works at the new factory of the company. Mr. Gates has been connected with the Berlin company for a number of years.

Taylor Alderdice, third vice president of the National Tube Co., has been re-elected a member of the board of directors of the chamber of commerce, Pittsburg. Willis L. King, vice president of the Jones & Laughlin Steel Co., who has been serving as a director, recently resigned.

A .W. Stadelman, manager of sales for the Wellman-Seaver-Morgan Co., Cleveland, has severed his connection with that company to become vice president of the Darley Engineering Co. Mr. Stadelman will be located at the New York office of his company, 180 Broadway.

H. R. Butler, formerly connected with the Jeffrey Mfg. Co., and the Browning Engineering Co., has become connected with the Yale & Towne Mfg. Co. and will represent this concern on its cranes and hoists in western territory.

The resignation of F. F. Bullard from the office of general manager of Morgan Spring Co., Worcester, Mass., which was received by the officers of that company some months ago, has just been announced to the public. This resignation is to take effect July 1.

J. E. Tesseyman, who has been general superintendent of the Ralston Steel Car Co., Columbus, O., has been appointed general manager of the company. He takes the place of Anton Becker, who becomes third vice president. President Ralston expects to be able to reopen the plant within a few days or weeks at the outside.

Herbert C. Petty was elected May 13, a director of the Crocker-Wheeler Co. Mr. Petty accepted a position in the sales division of the company in January, 1903, and has advanced rapidly to the position of contract manager.

MANUFACTURERS FAVOR OCEAN MAIL SUBVENTIONS.

At the opening session of the annual convention of the National Association of Manufacturers, New York City, May 18, resolutions were adopted favoring ocean mail subventions to lines running to South America and the Orient. George S. Seabury, in an address on the promotion of foreign trade, which was largely an argument for ocean mail subvention in which he arraigned certain manufacturing interests for their opposition to the plan, elicited a reply from Z. D. Scott, a Duluth lumber owner, who defended what he said was the general business sentiment of his section against an unduly high tariff wall.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND.

BOSTON.....1053 Exchange Bldg.
BUFFALO.....932 Ellicott Sq.
CHICAGO.....1328 Monadnock Blk.
CINCINNATI.....First National Bank Bldg.
NEW YORK.....1005 West Street Bldg.
PHILADELPHIA.....408 Central Trust Bldg.
PITTSBURG.....510 Park Bldg.

Subscription, United States and Mexico, $3.00 per annum. To Canada and Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co. will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND AS SECOND CLASS MATTER.

PRINTED IN AN OPEN SHOP.

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May 21, 1908.

THE RELATION OF IRON ORE TO THE OTHER NATIONAL RESOURCES.

One could not expect that the three days' convention at Washington last week on the conservation of our natural resources would be able to digest even a small part of the great mass of information and suggestion which was presented, so that it is in no spirit of criticism that an effort is made here to point out that at some stages of the proceedings certain features of the problem were taken out of their natural bearing, thus distorting the picture which this convention was designed to furnish of our national duty in the premises.

Our iron ore reserves were loosely mentioned in the same breath with the timber which is being rapidly exhausted and with the soil the fertility of which is being reduced by improper farming and by erosion. It is important that certain clear distinctions be drawn before any effort is made to take definite action. When erosion carries a ton of fertile soil into the ocean, there is absolutely no gain to anyone; when the average piece of timber is put into use, its substance is given to the elements before there has been time for a new tree to grow. When, on the other hand, a ton of iron ore is mined and converted into iron or steel, the people still have that iron or steel and in the majority of cases, when it has served its life, usually a long one, in some particular form, it can be reworked into a new form and begin an entirely new life. Barring oxidation, iron is practically indestructible.

It is true that we should not fritter away our resources; we should conserve them, but we should not necessarily refrain from using them. In the improvement of every municipality, the question of the limit of bonded indebtedness usually arises at one time or another. It is not well that it should refrain from making the improvements, but it should select the best improvements to make, so that, while it is under the indebtedness, it enjoys the facilities.

Andrew Carnegie, in the course of a very interesting address, full of statements of fact which there is no occasion to question, presented some arguments which had a tendency to take these things out of their natural setting, as in one sentence he advocated the substitution of water for rail carriage for the double purpose of reducing the coal used in motive power, and the coal used in smelting. His figures were ten billion tons of iron ore reserves and twenty-five hundred billion tons of coal reserves. The ore reserves he considered meager. Now, with the utilization of blast furnace gas, it has been claimed that an entire steel works, not carrying the rolling processes too far, can subsist on the fuel required by the blast furnace, but let the liberal estimate be made that one ton of coal be required to carry a ton of iron ore through the average finished product of the steel works, and we find that only 1/250 part of our coal reserves will be required to work up all our iron ore reserves. Why should we bother trying to save a portion of that 2/5 of 1 per cent?

Again, it is taking these things out of the setting to compare the fuel and iron consumption by rail transportation with the consumption by water transportation, since the setting is one of centuries, and the costs compared are those of the present day. Half a century, perhaps a quarter of a century, hence, the railroads are likely to be using electrical power, generated by no more expensive methods than central power plants using coal, and greatly exceeding in coal economy any kind of plant that can be carried afloat. As the steamboat power plant is more economical than the locomotive power plant, so the stationary power plant of the future railroad will be more economical than either.

As to the relative consumption of iron by rail and water transportation, it is hard to see any point. It is true that brake shoes, wheels and rails wear, but that wear is light relative to the volume of the total stream of iron which passes through the form of railroad use. On the other hand, steamboats blow up, burn up and go to the bottom. Our argument leads us to a pretty small division of those ten billion tons of iron ore.

The relatively small waste of iron in railroad rails was referred to in these columns last week. There are about 300,000 miles of standard railroad track in the United States. If laid together with 100-pound rails, they would involve 47,000,000 tons, and if of ordinary rail steel, the rails would easily last an average of 10 years, with a much heavier traffic than they must now carry. Less than a fifth would actually wear away, representing less than a million tons a year of actual loss. By improvement of the steel with nickel or other alloy metals, the annual loss could be reduced to negligible proportions. Car wheels and brake shoes wear more rapidly than rails, but their tonnage is relatively light. The light forms of steel, such as sheets, tin plates, wire, etc., are much subject to oxida-

tion or other waste, but they constitute only a small proportion of the total stream of iron flowing from the ore mine into channels of use.

Should the discussion come, as it ought, to a consideration of the relative waste in different industries, the iron industry deserves a decoration. It is stripping a hundred feet of overburden, in cases, on the Mesabi range, and thus avoiding the burying of valuable timber, because it has capital which it can lock up in such immense stripping operations, where a poor industry would have to make the mine pay as it goes, and use the timber. It is producing millions of barrels of cement annually from one of its waste products, and tens of thousands of tons of iron sulphate annually for fertilization and water clarification, out of another of its waste products, and with its ability, energy and capital it is advertising the use of these products. It is spending large sums of money in the erection of by-product coking plants and the building of gas engines. Its iron and steel products are a measurably permanent contribution to the public wealth, since they can be re-worked indefinitely.

The worthless material of today may be the ore of tomorrow. There is no scientific definition of an ore; an ore is simply material which by present methods can be utilized with profit. Methods may change from year to year, while iron ore supplies are a question of centuries. New discoveries likewise increase the known supplies. Despite the heavy annual drain, it is probable that in every year the known workable supplies of iron ore in the United States have increased while the supply of iron in actual use has increased rapidly as well. The average iron content (natural state) of the Mesabi ores listed in the 1907 analysis pamphlet is almost exactly four units less than the average of the ores listed in the 1898 pamphlet, a decrease of four units in nine years. What has that really done? It has, it is true, greatly enhanced the importance of rich iron ores, and given them a value in the ground which no one ever dreamed of putting on them in 1898, but it has also greatly enlarged our estimate of the workable reserves. It has added a cost large in itself but almost negligible in comparison with the recognized value of steel in use, while it has added billions to the estimate of our reserves.

Of all our natural resources, our iron ores are the one which can be drawn upon with the greatest impunity, because the iron remains. The forests and the soil should merit first attention in an effort to conserve our natural resources. According to what was said at Washington, our forests at the present rate will be gone and our soil badly impoverished long before one single per cent of the present coal reserves have been used, and coal stands in more need of conservation than iron ore.

WHAT THE OCEAN MAIL BILL IS.

All industrial America has a direct and vital interest in the Gallinger ocean mail bill, which passed the national senate without a division but with an overwhelming majority on March 20, and now remains to be enacted by the house of representatives.

The ocean mail bill, on the routes indicated by the postoffice department, calls for the service of about 30 steamships of large size and high power. At least 20 and probably 25 of these steamships will have to be constructed in American ship yards before these new mail services can be started—for more than four or five steamships of the requisite character do not now exist in the United States. It is estimated that these new steamships will cost, according to size and speed, from $1,000,000 for the smallest ships to South America, to $2,500,000 for the largest and swiftest liners to the orient. Assuming that the average price of each ship will be $1,500,000, the building of 20 ships will mean an expenditure of $30,000,000 right away for American materials and labor. Steel plates and shapes and all kinds of material for the construction, equipment or repair of vessels like these designed exclusively for the foreign trade are on the free list of the Dingley tariff, and ship steel at the present time is being laid down in American yards at substantially the same price for which it can be imported from Europe.

About one-half of this $30,000,000 will represent the expenditure in the ocean ship yards where the new mail steamers are constructed. The other half, or very nearly half, will represent the expenditure on the materials of the vessel in the mines of the northwest, the steel works of the middle states, the forests and lumber mills of the west and south, and scores of shops and factories located in almost all our states, where the hundreds of articles requisite for the construction of the hulls and engines of the ships, for their equipment and for their furnishing, are fabricated. A mail steamship is more than a steel box fitted with machinery; it is a floating warehouse and hotel in one, and it requires for its completion practically all of the things that are needed in the making of a great business block or hotel on shore, and, besides, a great many special articles demanded for safe and swift navigation over rough and distant seas.

Is it strange that when the true scope and purpose of this ocean mail legislation were carefully explained in the United States senate last month, the bill was finally passed without a voice being raised or a vote recorded against it? The only opposition to this measure now comes from men who have not taken the trouble to read it and ascertain what it really means. Its fate will be settled within a few days. If you have not already written to your congressman about it, do so at once.

After being active rivals for a number of years, the *Railway Age* and the *Railroad Gazette*, two very able journals, have been consolidated and the new periodical will be published under the name of *Railroad Age Gazette*. The union of forces of these two railway papers ought to result in the publication of an exceedingly strong journal. THE IRON TRADE REVIEW extends its best bishes to its highly esteemed contemporaries who have decided to unite their fortunes.

CONSERVING OUR ORES.

Opinions of Andrew Carnegie, James J. Hill and President Van Hise.

The addresses of Andrew Carnegie and Chairman James J. Hill, of the Great Northern railway, before the conference on the conservation of natural resources called by President Roosevelt at Washington last week, attracted wide attention, particularly among manufacturers. Both dealt more especially with the coal and ore resources of the United States, and both pointed out factors which, in their opinion, threatened the at present seemingly limitless resources. Mr. Carnegie spoke on "The Conservation of Ores and Related Minerals," in part as follows:

The total production of iron ore in the United States up to 1890 was some 275,000,000 tons; in the next ten years it was nearly 200,000,000, and in the seven years from 1901 to 1907 more than 270,000,000 tons were produced, or nearly as much as the total for the first century of our history. The aggregate production to date, 750,000,000 tons, is about one-thirteenth of the estimated original supply. At the recent rate of increase (doubling each decade) the production in 1918 will exceed 100,000,000 tons, by 1928 200,000,000 tons, and by 1938 it will be over 400,000,000 tons—that is, in that single year, which many of us may expect to see, an amount approximating the entire production in the United States up to the close of last year. By that date about half of the original supply will be gone, and only the lower grades of ore will remain, and all the ore now deemed workable will be used long before the end of the present century.

In my opinion, we should watch closely all the assets and begin both to save and to use them more wisely. Let us begin with iron. We must in all possible ways lessen the demands upon it, for it is with iron ore we are least adequately provided. One of the chief uses of this metal is connected with transportation, mainly by rail. The same freight may be moved by water, so that the substitution of water carriage for rail carriage would reduce the consumption of iron by three-fourths to seven-eighths. At the same time the consumption of coal for motive power would be reduced 50 per cent to 75 per cent with a corresponding reduction in the coal required for smelting. No single step open to us today would do more to check the drain on iron and coal than the substitution of water for rail carriage wherever practicable, and the careful adjustment of the one to the other throughout the country.

Mr. Hill's Address.

That portion of Mr. Hill's address on "The Natural Wealth of the Land and Its Conservation," which pertains to iron ore and coal resources, following his reference to forest denudation, is in part as follows:

The most favorable view of the situation forces the conclusion that iron and coal will not be available for common use on anything like present terms before the end of this century; and our industrial, social and political life must be readjusted to meet the strains imposed by new conditions. Yet we forbid to our consumers access to the stores of other countries, while we boast of our increased exports, of that material for want of which one day the nation must be reduced to the last extremity.

President Van Hise's Comment.

Commenting in an informal discussion upon the address of Mr. Carnegie, especially upon the iron and steel conservation portion, President Charles R. Van Hise, of the University of Wisconsin, said:

While the additions to the known reserves of iron ore available to the United States which are to be made by discoveries in the western states, in Canada, in Mexico, in Cuba, and in South America, are uncertain, it is hardly possible that the amount will not be very important; but as yet there is no reason to suppose that the discoveries in any of these countries, with a possible exception of Cuba, will reveal iron ore deposits comparable in importance to the Lake Superior and the southern Appalachian districts.

It appears probable, therefore, that for years to come, iron ore available to the United States will continue to be discovered more rapidly than it is exploited, and that consequently the known total reserves will increase rather than decrease. Hence the crest for known iron ore reserves of high grade may be some years in the future.

While, therefore, it is safe to say that the available high grade iron ore will be adequate for possibly a century, even if the rate of production further greatly increases, it is to be remembered that as the percentage of iron in the ore goes down, a larger amount of coal is required to obtain a ton of metallic iron, and that therefore, in proportion as our rich ores are exhausted, the draft will become steadily heavier upon the most important of the underground resources, fuel.

Iron ore available to the United States, President Van Hise believes, will continue to be discovered more rapidly than it is exploited, and consequently the known total reserves will increase rather than decrease. The highest point for known iron ore reserves of high grade may therefore be some years in the future. Nevertheless, President Van Hise expressed his conviction that in exploiting the metallic ores it is the duty of this country to do so in such a fashion that the reserves of lower grade products not now available because of market conditions, may in the future be exploited. It is also a national responsibility, he pointed out, to use metals which have been mined and reduced, so that the yearly loss shall be as small as possible.

The Philadelphia stack of the Sloss-Sheffield Steel & Iron Co., Florence, Ala., was blown out April 21.

NEW ORE CONCERN.

Philadelphia Capital Is Developing New Berks County Field.

A long series of tests for iron ore in Berks county, Pa., has proved so successful that a new concern, the Keystone Bessemer Ore Co., has been chartered in Delaware with $1,000,000 capital by Philadelphians to take up the industry on a large scale. The company has secured about 900 acres near Boyer's station, on the East Pennsylvania division of the Reading railway, and has sunk a shaft 200 feet deep to the ore. A steam shovel is to be installed soon, and when the iron trade resumes its old-time activity, it is expected to push operations vigorously. Some 3,000 tons of ore taken out in tests have shown an average iron content of 60.2 per cent.

Within a 30-mile radius of the new operation, there are not less than 25 blast furnaces, and it is proposed to sell the ore to these, the company having no furnace affiliations itself. Some 30 or 40 years ago this portion of Pennsylvania was dotted with ore mines, from which large fortunes were made, but, with the development of the Lake Superior ore industry, nearly all of them were driven out of business, not being able to compete with the easily mined Mesabi ores. While the Pennsylvania ores generally are not so rich as the Lake Superior and their mining is more expensive, they have a great advantage in having a market close to the mines, the rail haul to the numerous Schuylkill and Lehigh valley furnaces not averaging over 50 cents a ton.

The officers of the Keystone Bessemer Ore Co. are: President, W. T. B. Roberts, a large builder of Philadelphia; vice president, Colonel T. B. Wiedersheim, of the Girard National Bank, Philadelphia; treasurer, Frank B. Muhlenberg; secretary, Warren H. Gotwald. Messrs. Roberts, Muhlenberg and Gotwald and Horace Trumbauer, a prominent Philadelphia architect, are the incorporators.

This new company has no connection with the reported opening of the Boyertown, Pa., ore mines. These mines, which were first worked about 200 years ago and furnished the iron for the first furnace in Pennsylvania, were reported leased about two years ago to the Bethlehem Steel Co., but the deal seems to have fallen through. They have been sunk to a depth of 1,000 feet and accumulate so much water that their operation is not feasible unless the most modern equipment is put in.

SCULLY STEEL & IRON CO.

Absorbs Kelley, Maus & Co.—Steel Warehouses Will Be Constructed.

The Scully Steel & Iron Co. of Chicago has closed negotiations for the purchase of the real estate, warehouses and the greater part of the merchandise of Kelley, Maus & Co. The purchase by the Scully Steel & Iron Co. does not include the accounts and bills receivable of the Kelley-Maus Co., and the Scully Steel & Iron Co. does not assume any of the indebtedness of the Kelley-Maus Co.

This deal involves a large sum, something over $1,000,000, for the business of Kelley, Maus & Co. has been very large, they being one of the oldest steel and iron houses in Chicago, established in 1877 by Messrs. Kelley and Maus, and later absorbing the old established houses of S. D. Kimbark & Co., Parkhurst & Wilkinson and the Thompson-Hoof Co.

In this deal the Scully Iron & Steel Co. takes over all the realty, buildings, merchandise and business of Kelley, Maus & Co. The land represents property already improved by the erection of two modern warehouses, each 100 by 300 feet, two stories. These buildings are on land recently taken under a 99-year lease, and represent about 250 by 700 feet at Ashland avenue and Twenty-fourth street. The Scully Steel & Iron Co. has also closed a 99-year lease for the premises adjoining this property on the south, so it will have a tract of land about 1,400 feet on Ashland avenue, running back about 250 feet to a slip, which runs along the western boundary of 1,400 feet and fronts about 250 feet on the river.

Upon this land the Scully Steel & Iron Co. will at once erect new warehouses of steel construction, equipped with the most modern appliances for handling material rapidly and economically. These new buildings in connection with the buildings to be taken over from Kelley, Maus & Co. will give the Scully Steel & Iron Co. one of the largest and most up-to-date plants in the country for handling steel, iron and kindred lines.

The Scully Steel & Iron Co. will add to its present line of merchandise the heavier lines carried by Kelley, Maus & Co., and the lighter lines, including wagon and carriage makers' and blacksmiths' supplies now carried by Kelley, Maus & Co., will be carried by a new corporation to be called the Chicago Iron Store, owned by W. M. Thompson, now secretary and general manager of Kelley, Maus & Co., and A. B. Scully, president of the Scully Steel & Iron Co. This business will be conducted in the building at the west end of the Randolph street bridge, now occupied by Kelley, Maus & Co. as a branch store. The Scully Steel & Iron Co. and the Chicago Iron Store will work in very close affiliation, and as they will both be located on the river, they will be able to make quick delivery by water from either plant to customers located on the river and also to railroads.

It is understood that Fred K. Maus, who is now president of Kelley, Maus & Co., will, for a time, be connected with both the Scully Steel & Iron Co. and the Chicago Iron Store. W. M. Thompson, who will be at the head of the Chicago Iron Store, has for some time been active manager of the business of Kelley, Maus & Co., and is one of the best and most favorably known men in the trade. He is at the present time president of the Hardware Jobbers' Association, which has affiliations all over the United States. A. B. Scully, president of the Scully Steel & Iron Co., is very well known in steel and iron circles, having lived in Chicago all his life.

Mr. Scully looks upon the present time as the most favorable for the putting up of a plant on so large a scale, feeling that the present conditions are only temporary, and, with every confidence in the future greatness of Chicago, he is laying his lines so that the plant about to be established will be in position to give the best results.

This combination or specializing covers an extensive line; in fact, the entire lines, such as structural steel, bars, hoops, bands, boiler shop and railroad supplies, sheet iron workers' supplies, electrical steel, corrugated sheet iron, iron and steel machinery, boiler tubes of all kinds, also wagon makers', carriage makers' and blacksmiths' supplies, and a full line of machinists' supplies and hardware.

Division of these lines represents practically under one management the entire list of steel and iron in every known line, and it is figured that the specializing and dividing of these lines will work very satisfactorily, especially to the consumer, who can cover in one order anything he may require with the assurance of prompt delivery.

The Lake Superior Iron & Chemical Co. has closed down its furnace and plant at Elk Rapids, Mich., giving as a reason the low price of iron and slack demand. It is not expected that the furnace will go into blast before August, after repairs are made.

ENLARGES OUTPUT.

Lane Tool Plant's Absorption Causes Change in Massillon Plant.

The purchase of the interests and business of the Lane Tool Co., Cleveland, by the Massillon Foundry & Machine Co., Massillon, O., recently, has caused no change to be made in the organization of the Massillon company, excepting that F. E. Lane, of the Lane company, has become a participating stockholder and member of the board of directors. The equipment and tools formerly used by the Lane company at Cleveland are being moved to the Massillon plant, and from time to time such further additional improvement as may be found necessary will be added.

The Massillon company has completed an addition to its plant of a brick building 60 x 150 feet, which will be used as a machine shop and erecting department for steam hammers. The machinery is now being installed and the company expects to begin to manufacture new output about June 1. It is the intention of the Massillon Foundry & Machine Co. to deal largely through jobbing machinery houses, having an agency in each of the larger cities. From present indications, the officers of the company believe that it will have a very satisfactory business along its line, especially when conditions become more favorable, which they confidently expect to see within the next several months.

Concessions Refused.—The southern Ohio furnace men held a meeting in Cincinnati on May 12, with the railroads carrying coke from the B. & O., C. & O. and N. & W. fields, with a view to obtaining a reduction in the present rates of freight on coke from the districts mentioned to their furnaces. The railroads declined to make any concession in the rates and the meeting adjourned with nothing having been accomplished in the way of freight rate changes.

R. W. Breadner, appraiser of the customs department, Ottawa, has been appointed head of the newly constituted tariff department of the Canadian Manufacturers' Association. The object of this departure is to place at the service of the members a tariff expert, when questions as to tariff construction or grievances in connection with the administration of the system arise. Mr. Breadner has been a member of the Dominion customs board since 1899.

OPTIMISM PREVAILS.

(Continued from first page.)

cial condition is excellent and a net gain of five in membership during the half year. In the absence of F. A. Geier, chairman of the uniform costs accounting committee, an interesting report was made by C. Wood Walter, of the Cincinnati Milling Machine Co., in connection with the recommendations made by Benj. A. Franklin, of M. and F. Borton, an expert, who was given the benefit of the best experience of the association members. Mr. Walter made a plea for reasonable average profits, which in the machine tool line are low in comparison with other manufacturing industries. These low selling prices in comparison to costs he attributed partly to a willingness to put profits back in the business in order to keep abreast of modern progress, which demands a larger average profit than that of today. A more important reason he found in the fact that manufacturers are largely inclined to underestimate actual costs by omitting certain legitimate items and are selling machines on an imaginary profit, and then being forced, at inventory, to charge off many items which should be regularly entered as costs.

It was to eliminate this error, so far as possible that a committee was named several years ago to work out a uniform schedule in arriving at true costs as a basis of figuring legitimate selling prices.

Simplicity, safety and completeness were aimed at in the report submitted as a result of this work, in the course of which it developed that many manufacturers made no effort to figure costs, while many others made only a partial estimate. Mr. Walter made a plea for the use of the schedule basis recommended in arriving at the memorandum of costs upon which selling prices are based, and for reasonable, average profits in good times and bad.

The schedule was explained in detail by its author, Mr. Franklin. Its fundamental elements of costs are materials, direct labor, all over-head manufacturing expense and all selling expense. The report was adopted, the special committee continued and the members were urged to adopt it as soon as possible.

At the request of E. P. Bullard, the apprenticeship committee was empowered to publish the results of its work to date for distribution. The plan is now in successful operation and many requests for diplomas are being received by the secretary.

The formal opening of the Machinery Club, situated on the twenty-first and twenty-second floors of the Fulton Terminal building, New York City, is announced by the governors for 1 p. m., Thursday, May 21.

CINCINNATI NEWS NOTES.

Office of THE IRON TRADE REVIEW,
408 Central Trust Bldg., May 19.

The situation with the machine tool manufacturers shows but little change. Orders are spasmodic and the underlying conditions continue to be regarded as about the same as in the recent past. With the shops running light, local foundry business is naturally affected, and orders for castings are irregular and quite moderate in volume. Engine builders continue to report considerable business pending, but the tendency appears to be to defer purchases.

It is reported that a rolling mill enterprise is looking for a location in this city and it is quite likely that a new rolling mill industry will be established here in the near future, but meager details are given out at this time.

The Newport rolling mills will resume operations beginning on Monday, May 18, with the exception of the sheet mills Nos. 1 and 2 which are shut down for repairs. The mill has been closed for some time. The new Andrews mill is in operation and is reported to be working very satisfactorily.

The Cincinnati Southern railroad has closed a contract for the right to manufacture for its own use an automatic locomotive stoker, patented by W. T. Hanna, of this city. The railroad has given the stoker a practical test of four months and it has proved satisfactory. The Mechanical Construction Co., owner of the patent, was incorporated this week, and will build a plant here and manufacture the stokers.

STOVE MANUFACTURERS' CONVENTION.

Beginning with the formation of the "Federal Furnace League" at a conference of the Master Sheet Workers' Association and the furnace manufacturers on Monday afternoon, May 11, the annual meetings of stove manufacturers were held in New York City at the Hotel Astor. The Stove Founders' National Defense Association convened for the twenty-second time on Tuesday and on Wednesday and Thursday was held the thirty-seventh annual meeting of the National Association of Stove Manufacturers.

The formation of the Federal Furnace League was the outcome of two prior conferences at Philadelphia, and its intent is to conserve the interests of those who manufacture and install heating furnaces. An address was made by Chas. S. Prizer on the "Merits of the Warm Air Furnace." Following the reading of the paper an election of officers was held and the following chosen: President, Charles S. Prizer, Philadelphia; vice president, Fred E. Lee, Dowagiac, Mich.; treasurer, Fred H. Moore, Utica, N. Y.; secretary, Wilson Ferguson.

CONVENTION ADJOURNS.

Amalgamated Association Will Ask Last Year's Wage Scale of Employers.

The thirty-third annual convention of the Amalgamated Association of Iron, Steel and Tin Workers, which has been in session for several weeks at Youngtsown, O., adjourned May 19 to meet next year in Detroit. All the national officers were re-elected, with the exception of Thomas Williams, who was defeated for vice president of the finishing division by Richard Fitzgerald, Wheatland, Pa.

In general, last year's wage scale was adopted. The sheet and tin workers were defeated in their endeavor to re-establish a limit to a mill's output. For the first time in its history the Amalgamated Association decided to accept negroes as members. In the Pittsburg district and in the mills throughout the south many negroes are employed as puddlers, heaters and finishers. A conference committee was appointed, the boiling division including 10 members, the finishing division 10 members, the sheet division eight members, and the tin division nine members. No date for a conference with the Republic Iron & Steel Co. and the Western Bar Iron Association, whose employes are largely members of the Amalgamated Association, has yet been set. The prevailing opinion is that both puddlers and finishers will have to accept a reduction before an agreement can be reached with their employers.

The Mount Vernon Car Mfg. Co., Mt. Vernon, Ill., announces authoritatively that work in all departments has begun, and that enough work is on hand to run the plant until Aug. 1. The contracts upon which the company is working, however, were taken long before the depression, but were held up on account of last fall's panic.

The Universal Engineering Co., 95 Liberty street, New York City, informs us that it wishes to hear from responsible manufacturers of iron and steel products, machinery, auxiliary apparatus or engineering specialties with a view to acquiring agencies in these lines.

E. A. S. CLARKE*

E. A. S. Clarke, president of the Lackawanna Steel Co. and one of the directors of the American Iron and Steel Institute, belongs to the younger class of executives who, by reason of exclusive connection with iron and steel manufacture throughout their business careers, have risen to positions of responsiblity and influence in the industry at an early age. Mr. Clarke is 46 years of age. He is a native of Canada, born at Ottawa, Jan. 31, 1862, and may be said to have inherited a fondness for the work in which he has engaged, for his father, T. C. Clarke, was well known as a civil engineer and bridge builder. Mr. Clarke is a Harvard man, gaining his degree of A. B. with the class of '84, but before entering Harvard he had lived in various parts of Canada and the United States and had spent about three years abroad, principally in Switzerland and Germany.

After his graduation from Harvard, Mr. Clarke went to Sharpsburg, Pa., where in September, 1884, he entered the employ of the Spang Iron & Steel Co., in the laboratory department, under Robert Forsythe, who was then general manager. Less than a year later, in June, 1885, he went to the Union Steel Co. at Chicago, here also under Mr. Forsythe, and worked first in the laboratory and afterwards in various parts of the mills until March, 1890, when he was appointed assistant superintendent of the Union works. Meantime the Union Steel Co. had become a constituent of the Illinois Steel Co., and in October, 1891, Mr. Clarke was transferred to the South Works of the Illinois company as assistant general superintendent, a position he held for about four years until his appointment, in December, 1895, as general superintendent. Three years later, at the beginning of 1899, he became general manager of the Illinois Steel Co.

When, after about a year in this position, Mr. Clarke resigned and left the Illinois Steel Co., it was to become general manager of manufacturing of the Deering Harvester Co. This was in March, 1900, and upon the formation of the International Harvester Co. in the fall of 1903, he was made general manager of manufacturing of that extensive interest. During his connection with the Deering Harvester Co., and with the greater corporation of which it formed a part, he had charge of the building of blast furnaces, Bessemer steel works and rolling mills which, with ore lands and coal reserves, are now known as the Wisconsin Steel Co. In the fall of 1904, he resigned from the Harvester company and on Dec. 15 of that year, became president of the Lackawanna Steel Co. His work in connection with the building up of the great plant at West Seneca, with its remarkable facilities for ore-handling and other features representing the best of modern-day steel practice, is a matter of familiar history to those in touch with the industry.

E. A. S. CLARKE,
Director American Iron and Steel Institute.

Lackawanna Steel Co. Properties.

The Lackawanna Steel Co., at its plant at Lackawanna, N. Y., near Buffalo, has seven furnaces with an annual capacity of 1,080,000 gross tons. Its rolling mills and steel works at Lackawanna have a capacity of 1,345,000 tons of steel ingots and castings; 540,000 tons of slabs, blooms and billets; 175,000 tons of sheet bars and small billets; 670,000 tons of standard and light rails; 405,000 tons of other finished products. The company owns and operates foundries at Lackawanna for the manufacture of iron, steel and brass castings; it owns the South Buffalo Railway Co., which operates 35 miles of track. It owns 470 by-product coke ovens at Lackawanna and controls 237 by-product ovens owned

*Fifth of a series of brief biographical sketches of officers and directors of the American Iron and Steel Institute. The first of the series was Elbert H. Gary, April 16, the second, Willis L. King, April 23, the third, John A. Topping, May 7, and the fourth, Wm. A. Rogers, May 14.

by the Lackawanna Iron & Steel Co., at Lebanon, Pa., the total annual capacity being 1,064,000 net tons of coke. The company owns about 15,000 acres of coking coal lands, in Washington county, Pa., having an annual output of approximately 2,000,000 tons. On this property are 278 beehive coke ovens. All the stock of the Seneca Transportation Co., operating seven steamships and barges, is owned by the Lackawanna Steel Co. Practically all the stock of the Lackawanna Steel & Iron Co., including five blast furnaces at Cornwall and Lebanon, Pa., and all the stock of the Lackawanna Coal & Coke Co., having 12,000 acres of coal rights in Cambria and Indiana counties, Pennsylvania, and 5,000 of coal lands in fee in the same counties, is owned by the Lackawanna Steel Co., as is also the stock of the Franklin Iron Co., which owns 650 acres of farm lands and about 7,000 acres of mountain lands. The iron ore interests of the Lackawanna Steel Co. are extensive.

CUSTOMS DECISIONS.

The board of appraisers of the United States customs has rendered a decision disregarding a court decision in which ferro-alloys were held dutiable by similitude to manganese at $4 per ton and not at 20 per cent, and has followed a ruling on altogether different merchandise, and, with a little additional testimony, has sustained the 20 per cent assessment. The importers have taken an appeal. The board held that pewter turnings, the refuse of the manufacture of machine bearings, is free of duty. Swath turners were held last week dutiable at 45 per cent under the catch-all paragraph of the tariff for manufactured metals. A protest of the Monsanto Chemical Works, St. Louis, was overruled as to the assessment on so-called base lead bullion. The board found that base bullion was provided for in the tariff.

The authoritative statement is made that the press report to the effect that the LaBelle Iron Works' stack now in operation has been changed to foundry iron output is incorrect. No. 1 stack has been out of blast since Dec. 1, and No. 2, barring a couple of weeks in March, has been operating steadily on basic iron.

According to a compilation made by the *Mining World*, 41 mines and metallurgical works in the United States paid dividends for the first quarter of the year amounting to $11,633,196.

VOLUNTEER MINE

Sold to a Company of Which G. A. Tomlinson Has Control.

The Volunteer mine, a part of the estate of the late Senator R. A. Alger and located at Palmer on the Marquette range, has been sold to the Volunteer Ore Co. of Duluth. The president of the new controlling interest is G. A. Tomlinson, the vessel agent and owner. The Volunteer is in the district of high silica ores in which are also located the Steel Corporation's Moore mine, the Richmond of M. A. Hanna & Co. and the Empire opened last year by Oglebay, Norton & Co. The Volunteer mine, or rather the property of the Pittsburg & Lake Superior Iron Co. on which the Volunteer mine is located, was first explored in 1871 and since that time has been operated by various interests. The Alger estate acquired the property in 1890 and the last shipment of ore was made by the Steel Corporation. In all, nearly one and one-half million tons of ore have been mined from the Volunteer and recent exploration points to a large tonnage still available. The mine itself has been idle for three years past and shipments have been from stock piles. There will be required, therefore, a considerable amount of repairing of shafts and a general overhauling of buildings and equipment. The immediate future of the property is dependent on the conditions of the ore market. Last year the amount of siliceous ore shipped from the Cascade district was small and, in fact, with the large deposits of cheaply mined Menominee range ore available, the total shipments of all ores must be large in order to carry any very heavy output of high silica ore. There has been reason to believe, however, that a part of the 2,000 acres which are included in the transfer will show up better grades of ore.

The quantity of ore being shipped from the ranges is very slowly increasing. The list of Mesabi properties on the shipping list now includes the Mahoning, Susquehanna and Iroquois. On the Menominee range the Hemlock mine at Crystal Falls is sending some ore all rail to the Northwestern Iron Co. at Mayville, Wis., and Pickands, Mather & Co. are also shipping a little ore from the Stambaugh valley.

Etowah furnace No. 1, of the Alabama Consolidated Coal & Iron Co., was blown in on April 11. No. 2 stack at the Etowah furnace is out of blast indefinitely.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS AT DETROIT.

The semi-annual meeting of the American Society of Mechanical Engineers will be held in Detroit, June 23-26. An entire session will be devoted to papers on the conveying of materials, when hoisting and conveying machinery including belt conveyors, the use of conveying machinery in cement plants, etc., will be discussed.

Among other subjects which will be taken up by professional papers are: "Clutches," with special reference to automobile clutches, by Henry Souther; "Some Pitot Tube Studies," by Prof. W. B. Gregory, of Tulane University, New Orleans, La., and Prof. E. W. Schroder, of Cornell University; "Thermal Properties of Superheated Steam," by Prof. R. C. H. Heck, of Lehigh University; "Horsepower, Friction Losses and Efficiencies of Gas and Oil Engines," by Prof. Lionel S. Marks, of Harvard University; "A Journal Friction Measuring Machine," by Henry Hess, of Philadelphia; "A Simple Method of Cleaning Gas Conduits," by W. D. Mount; "A Rational Method of Checking Conical Pistons for Stress," by Prof. G. H. Shepard, of Syracuse University; and "The By-Product Coke Oven," by W. H. Blauvelt.

A lecture on "Contributions of Photography to Our Knowledge of Stellar Evolutions" will be delivered by Prof. John A. Brashear, of Allegheny, Pa. The usual receptions will be held and excursions will be made to manufacturing plants, the ship building yards and various points of interest in and around Detroit. Among the excursions planned is one to the University of Michigan, at Ann Arbor. The gas power section of the society will hold a session, and the Society for the Promotion of Engineering Education and the Society of Automobile Engineers will hold a meeting in Detroit at the same time. As far as possible, sessions will be arranged so that members interested in subjects treated by the other societies may attend their sessions without missing papers on related subjects read before their own society.

The Lackawanna Steel Co. is protesting strongly against the establishment of a new fire district near the steel plant, for which West Seneca, N. Y., authorities have been moving for some time. The company claims that it will have to foot practically the entire bill of increased expenses.

GRATITUDE

EXPRESSED BY AN INDEPENDENT COMPANY

To Judge Gary and Associates—Wisdom of Price Maintenance—Annual Report of the Empire Steel & Iron Co.

In the annual report of the Empire Steel & Iron Co. for the year of 1907, President Leonard Peckitt says:

"It is impossible for us to make any predictions as to the business for the present year, but in closing this report, we wish to say that in our opinion this company and the iron and steel trade in general owe a debt of gratitude to Judge E. H. Gary and his associates in the United States Steel Corporation for the influence which they have recently exerted in an effort to prevent what might otherwise have been a complete demoralization in the iron and steel business of the country. Experience oft repeated has evidenced the untold damage caused to business in general by endeavoring to force sales of iron in times of depression. The continuation of operations in the face of adverse conditions and the consequent cutting of prices, have never resulted in good to any branch of the business, and we recommend heartily the wisdom of the plan for all interests, both buying and selling, to join their efforts toward maintaining price of iron and steel products on a fair basis."

Concerning the finances and operations of the company, President Peckitt says:

The year 1907, which was in many respects the most extraordinary in the business history of the United States, has proved to be the most important in the history of this company. What has been accomplished toward the developemnt of policies adopted in former years should be a source of encouragement to every stockholder, establishing as it does the strength of the company's organization and holdings, and indicating the possibilities for future development and earnings.

Following out the recommendations made in our last annual report, your directors have been successful in placing the finances of the company in such condition as to insure the carrying out of an important beginning of plans long in contemplation with regard to a radical improvement of the properties. Not only was this accomplished without increasing our indebtedness, and without asking the stockholders to subscribe additional capital, but the financial obligations have been reduced and our working capital materially increased.

The management reports that on account of a lack of funds to finance the Alleghany Ore & Iron Co., operating furnaces and mines in Virginia, our investment in that company was rendering no return, and this largely influenced your directors in arriving at a decision to sell the stock held in our treasury.

From the standpoint of earnings the past year was by far the most successful since the organization of the company. The following is a statement of business for the year ending Dec. 31, 1907:

Total net earnings from operations (including dividends and interest on securities in treasury).....	$602,402.75
Deduct allowance for improvements, permanent repairs and depreciation of mining properties, etc....	85,146.60
Total net profit for year.	$517,256.15

The following charges were made against the profits as shown above:

Depreciation in values, raw material and pig iron stocks, Dec. 31, 1907.....	$ 59,735.62
Sinking fund for bad debts..	9,804.32
Dividends on preferred stock	150,000.00

After closing the books, therefore, at the end of the year, there is shown a surplus of more than $1,000,000. The full dividend of 6 per cent on the preferred stock was paid and the directors considered carefully the advisability of making a payment on the accumulated dividends, which now amount to 18 per cent, but in view of the conditions existing in the money market towards the close of the year, rendering collections exceedingly difficult, and also in view of the necessity of carrying a large stock of material at the furnaces, it was deemed wise to retain this money in the business until the return of more normal conditions. Furthermore, it should be borne in mind that this surplus was created for the purpose of providing funds to carry on the improvements at your furnaces and mines, and also to allow adequate working capital for conducting a large business. By applying the available funds to this work, in our opinion, your returns will in a few years be much greater, and meanwhile there is every reason to believe that dividends can be maintained on a liberal basis, and by paying the back dividends gradually, the entire obligation to the preferred stockholders can ultimately be cancelled without the necessity for funding the present deferred payments, and without depriving the company of money needed for purposes previously set forth in this report.

We submit for comparison the following statement of the result of business year by year since this company was incorporated, the first year covering a period of nine months.

Year.	Tons pig iron made.	Tons ore mined New Jersey mines.	Net earnings.	Dividends.
1899	150,481	8,416	$ 320,666.30	$ 81,595.31
1900	201,847	40,637	244,523.85	106,395.00
1901	185,990	83,414	85,271.52	71,043.00
1902	186,485	59,179	203,087.37	75,000.00
1903	*245,513	107,905	308,651.02	75,000.00
1904	163,202	111,375	88,154.16	75,000.00
1905	172,763	93,568	91,511.96	75,000.00
1906	205,477	131,740	300,695.07	112,500.00
1907	234,538	146,253	517,256.15	150,000.00
	1,746,296	782,487	$2,159,817.40	$821,533.31

*Two additional furnaces operated under lease.

From this it will be seen that in all important respects the results during the past year have surpassed all previous records, and it might be interesting to note that our profits from all sources have amounted to $2.20 per ton of iron produced.

In a statement of this kind it is difficult for us to make a comprehensive report on the outlook at the mines in New Jersey, but you will see that the tonnage of magnetic ore mined exceeds that of all previous years. Looking towards continuous development in the future, we have had a magnometric and geological survey made on both properties, and the results have been highly encouraging. At Oxford another shaft will at an early date be located and put down, as we can not expect to increase the present output at the Washington mine from one shaft alone.

Ore is at present being taken from three shafts at Mount Hope, and the tonnage can be largely increased from two of these shafts with further progress in their development. Another large body of ore underlies a portion of the Mount Hope property, which we have, up to this time, held entirely in reserve, and we have good reason to believe that this deposit is even more valuable than that portion which we are now working. Last year the directors authorized an expenditure of money sufficient to erect at Mount Hope a modern central power

station and separating plant, equipped with crushers, screens, rolls and magnetic separators, together with the necessary storage bins and facilities for handling 600 tons daily. The method heretofore in use in the preparation of this ore involved the system of what is known as "hand-cobbing," which is expensive and unsatisfactory. By mechanical separation the ore can be put on cars at a much lower cost and will contain a higher percentage of metallic iron; for instance, the average metallic content of the ore shipped from Mount Hope at present is about 59 per cent, whereas with the system that we are now installing the ore will average 63 per cent to 65 per cent in iron. The machinery is now being installed, and it is our expectation to have the plant in full operation by July 1.

On account of very favorable conditions for the marketing of our product of pig iron, only a limited amount of improvement work was accomplished at the furnaces during the year. The new blowing engine at the Crane plant, of which mention was made in our last report, was installed, together with additional water tube boilers, and we now expect to proceed with the plans to enlarge one of the furnaces at Catasauqua and equip it with larger stoves and some of the more modern improvements. Similar improvements are also contemplated for the furnace at Oxford.

During the early months of the year, very high prices were obtained for pig iron, and contracts for large tonnages were made extending well into the year. There was every indication of a continuance of these conditions until the early fall, when signs of financial troubles became apparent, and thereafter, within a short time, the demand was reduced to a minimum, prices rapidly declined, and a large number of the consumers who had purchased iron under contract found themselves unable to accept shipments in accordance with agreement. This necessitated our blowing out one furnace after another, until only two stacks out of eight are at present in blast, the monthly product of which is about 5,000 tons of iron. The combined annual capacity is approximately 250,000 tons.

The properties of the company at this time consist of three furnaces at Catasauqua. Pa.; two furnaces at Reading, Pa.; one furnace at Topton, Pa.; one furnace at Macungie, Pa.; one furnace and 2,400 acres of land at Oxford, N. J., together with mineral rights on about 8,000 acres additional; 1,700 acres of land at Mount Hope, N. J.; 115 acres of land at Pine Island, N. Y., containing a large body of limestone.

The following is a condensed balance sheet taken upon closing the books Dec. 31, 1907:

ASSETS.

Real estate, plants and machinery		$2,996,009.60
Stocks and bonds		1,001,607.00
Cash in bank	$ 230,325.71	
Notes receivable	450,100.00	
Accounts receivable	217,691.55	
Inventories—		
Pig iron	183,684.67	
Raw material	256,361.05	
Supplies	77,391.37	
		1,415,554.35
		$5,413,170.95

LIABILITIES.

Capital stock—		
Preferred	$2,500,000.00	
Common	1,254,770.00	
		$3,754,770.00
Accounts payable	$ 207,536.16	
Bills payable	134,543.75	
Pay rolls	24,312.76	
Dividend No. 18, payable Jan. 2, 1908	75,000.00	
		441,392,67
Fund for depreciation and bad debts		84,356.95
Profit and loss		1,132,651.33
		$5,413,170.95

HANGING ROCK REGION.

Two Stacks Ready to Blow In, But Resumption Date Is Fixed for Only One.

Ironton, O., May 18—Supt. Jeffries, of the Hanging Rock Iron Co., has announced that the furnace would blow in as soon as a supply of coke can be secured, which will mean a resumption within the next 10 days. The plant has been idle since the early part of the year.

The local furnace of the Union Iron & Steel Co., which is in the hands of Supt. Chas. Peters as receiver, on order of the local courts will very likely be offered for sale in the very near future and it is current report that the Rogers-Brown Co., of Cincinnati, which has a heavy lien upon the property, will bid it in. J. R. Pollock, of Cincinnati, representing the firm, was here some weeks ago and made a thorough inspection of the property.

The Job Iron & Steel Co., which took over the plant of the Ashland Sheet Mill Co., at Ashland, Ky., has begun operation. Three of the six mills were started two weeks ago and the others will be placed in operation as rapidly as possible. The mill started with 275 men employed and expects to increase that number to the working capacity of 400 by the latter part of the month. The plant has a number of good orders booked and others are coming in.

W. L. Holmes, of Detroit, who was at Hamden, Winton county, recently, has had an inspection of the ores on the Puritan Cement Co. lands made and finds that they are richer in phosphorus than any to be found in the country. It is said the company is making plans for the erection of a 50-ton furnace to smelt these ores and that the work will be begun this summer.

The plant of the Parkersburg Iron & Steel Co., at Parkersburg, W. Va., which has been in operation almost without interruption throughout the depression, is still in active operation in all departments, with good prospects until well into the summer.

The work of remodeling the old nail mill plant at Parkersburg for the Scott Corrugated Roofing Co., recently removed from Cincinnati, is progressing rapidly and it is about ready for the installation of the new business. The machinery has been shipped from Cincinnati to the new site.

NEW ENGLAND FOUNDRYMEN'S ASSOCIATION.

Boston, May 16.—At the meeting of the New England Foundrymen's Association, held in this city May 13, the principal after-dinner address was by W. T. Hatch, construction and power engineer, who described in considerable detail, with diagrams, the plant of the Brown & Sharpe Co. and its electric power and lighting equipment, special foundry features, the sand blast room and other facilities which meet working requirements in an economical and satisfactory manner. One of the most interesting points in his paper was his description of the locating of the foundry building and of its roof construction, planned with a view to securing overhead daylight from the north, with exclusion of direct sunlight rays.

At the business meeting preceding the banquet, the members voted to secure space for headquarters for the delegation from this section that will attend the American Foundrymen's convention in Toronto. At the June meeting, the feature will be an entertainment program. For July and August, outings are in contemplation, the regular business meetings being omitted until September.

Construction Begun.—The Mt. Vernon Bridge Co., which was awarded a contract by the Buckeye Steel Castings Co., of Columbus, O., for the erection of a producer-gas building at the latter company's plant, has commenced work on the building. The company has not let the contract for its new pattern shop yet.

HONEST BUSINESS METHODS DEMANDED

AT MEETING OF SUPPLY AND MACHINERY DEALERS AND MANUFACTURERS.

Strong Stand Taken in Opposition to Lowering of Prices—Feeling Prevailed That Improvement of Commercial Conditions Has Started—The Richmond Convention

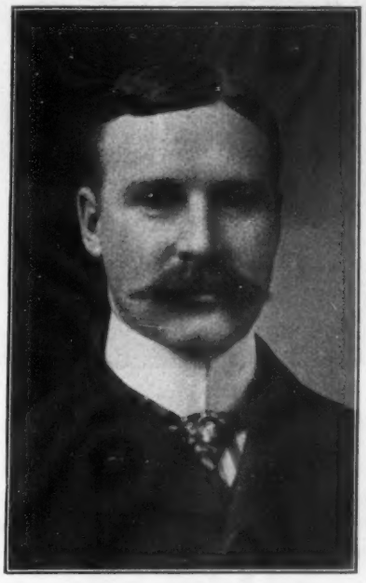
A vigorous plea for the upholding of the principles of honesty and fair play in business was the keynote of the joint meeting at Richmond, Va., last week, of the Southern Supply and Machinery Dealers' Association, the National Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association. This demand for plain, honest dealing was the text for at least two important addresses before the convention and was referred to by several other speakers. It was enthusiastically cheered and was embodied in resolution form.

The convention, due doubtless to its location, was not so largely attended as that of a year ago, but in accomplishments it was eminently successful. There was thorough good feeling among the three associations and many suggestions were exchanged. A member of one organization, who had resigned but postponed final action until after the gathering, was most enthusiastic in declaring his desire to remain in the association. Substantial progress was made toward the "resale price" goal and toward the adoption of a uniform contract between manufacturers and dealers. The expression was freely made that the turn in business conditions had arrived with the trying period surprising well weathered, and the machinery dealers were unanimously against any reduction in prices. Finally, there was much of instruction and encouragement to every listener in the spirited address of Chas. A. Moore, following the banquet which was served in the best of southern style.

Resale Prices on Rebate Plan.

Specific action in regard to the resale price question was taken at the joint session of the three associations Friday afternoon, following a full discussion of the subject in the separate sessions. This action took the form of the following resolution, prepared at a joint meeting of the manufacturers and conference committees:

> It being the sense of this convention that minimum resale prices, preferably on the rebate plan, are applicable to many lines in which we are mutually interested; be it
>
> Resolved: That our three associations jointly assembled endorse the resale price idea on such goods as are now being sold without adequate profit, and recommend its adoption on all such lines where practicable. And be it further
>
> Resolved: That the Southern Supply and Machinery Dealers' Association and the National Supply and Machinery Dealers' Association recommend that their members offer to such manufacturers as adopt this plan any and all assistance possible in tracing violations thereof in so far as such assistance will not conflict with federal and state statutes.



CHAS. F. AARON,
President American Supply and Machinery Manufacturers' Association.

The concluding joint session also adopted the following resolution, introduced by E. E. Strong, of the national association.

Resolved: That it is the sense of this meeting that the manufacturers of machinery, tools and supplies be encouraged as far as possible to maintain and not reduce prices at this time, believing the maintenance of present prices to be for the best interest of all concerned.

From the viewpoint of important results obtained, the joint session Thursday afternoon of the machinery members of the two supply associations was of foremost importance. The deliberations of this gathering culminated in the unanimous adoption of the following report presented by a committee composed of H. Prentiss, O. P. Meckel, W. J. McDowell, W. R. Colcord and A. J. Babcock:

Contracts With Dealers.

In a communication from our secretary-treasurer under date of Nov. 27, 1907, you have learned of the results obtained from the joint meeting of the special committee of the National Machine Tool Builders' Association and your machinery committee held at New York, Oct. 4, last. The selling agreement which was drafted at this meeting is now in the hands of the members of the two associations and, we believe, is meeting with general favor. We are informed that it is being used in making new selling agreements between manufacturer and selling agent. Your committee would recommend that the following preamble and resolution be adopted by this association:

> Whereas: A selling agreement has been drafted which has the approval of your executive and machinery committees and also of the special committee of the National Machine Tool Builders' Association appointed to consider this matter, and, whereas it is desirable that this agreement should be used whenever any existing selling agreement between manufacturer and selling agent is unsatisfactory, or whenever a new selling agreement is to be made, be it
>
> Resolved: That this association recommends the use of this agreement in all its essential features by its members as provided in preamble hereinbefore mentioned.

Against Price Reduction.

We are glad to note that in the depressed condition of business, which has prevailed during the past eight months, prices have been well maintained. We must give much credit

for this result to the manufacturers who have stood firmly to accomplish this. In this connection your committee is of the opinion that it would be wise to approve of the following preamble and resolution:

Whereas, a general reduction in prices of machine tools at the present time would have a demoralizing effect on trade, therefore, be it

Resolved: That this association, in convention assembled, does hereby emphatically protest against such action during the ensuing six months, coupled with the assurance that the dealers will cooperate with the manufacturers in every way possible for the maintenance of existing prices.

Sheet Metal-Working Machinery.

Your committee would urge all of our members who are interested in the sale of sheet metal working machinery to bring as much influence as possible to bear upon the manufacturers of said machinery to discontinue direct sales to the user, to increase the margin of profit to the dealer and to recognize and protect the regularly established machinery dealer.

For Honest, Open Methods.

Your committee believes that the work of this association should be conducted along broad lines, so that all members, whether in the machinery or supply lines, will feel that their interests are being carefully conserved and be strengthened in their purpose to employ only open, clean, unselfish and considerate methods in all their dealings, whether with the associates, manufacturers or patrons, realizing that such procedure promotes strength, harmony and merited success.

New Officers Chosen.

The election of officers at the Friday sessions, resulted in the retention of the retiring staff of the National association, with the exception of two changes in the executive committee, Messrs. McIntosh and Strelinger retiring. In the other associations extensive changes were made The secretary-treasurers of all three organizations were continued. The selections were as follows:

Southern Association.

President, J. C. Miller, the Miller Supply Co., Huntington, W. Va.; 1st vice president, E. A. Peden, Peden Iron & Steel Co., Houston, Tex.; 2d vice president, Percy G. Wall, Knight & Wall Co., Tampa, Fla.; secretary-treasurer, Alvin M. Smith, Smith-Courtney Co., Richmond, Va., executive committee, C. H. Briggs, chairman, Briggs-Weaver Machinery Co., Dallas, Tex.; J. A. Riechman, Riechman-Crosby Co., Memphis, Tenn.; H. C. Clark, Charlotte Supply Co., Charlotte, N. C.; E. F. Hartfelder, Hartfelder-Garbutt Co., Savannah, Ga.

Manufacturers and conference committee: W. H. Banks, Banks Supply Co., Huntington, W. Va.; A. M. Gibbes, the Gibbes Machinery Co., Columbia, S. C.; J. C. Fischesser, Alabama Machinery & Supply Co., Montgomery.

National Association.

President, George Puchta, the Queen City Supply Co., Cincinnati, O.; 1st vice president, Henry Prentiss, Prentiss Tool & Supply Co., New York;

GEORGE PUCHTA,
Re-elected President National Supply and Machinery Dealers' Association.

2d vice president, W. M. Pattison, Pattison Tool & Supply Co., Cleveland, O.; secretary-treasurer, A. T. Anderson, 41 Wade building, Cleveland, O.; executive committee, Chas. S. Farquhar, Chandler & Farquhar Co., Boston; James W. Wright, J. W. Wright & Co., St. Louis; W. L. Rogers, Pittsburg Gage & Supply Co., Pittsburg; F. B. Scott, Syracuse Supply Co., Syracuse, N. Y.

American Asscciation.

President, Chas. F. Aaron, New York Leather Belting Co., New York; 1st vice president, L. D. May, A. Leschen & Sons Rope Co., St. Louis; 2nd vice president, E. H. Hargrave, Cincinnati Tool Co., Cincinnati; 3d vice president, J. W. Gardner, Gardner Governor Co., Quincy, Ill.; secretary-treasurer, F. D. Mitchell, 309 Broadway, New York; executive committee, J. H. Drury, chairman, Union Twist Drill Co, Athol, Mass.; John Trix, American Injector Co., Detroit; S. P. Browning, Ohio Valley Pulley Works, Maysville, Ky.; C. A. Hubbell, T. R. Almond Mfg. Co., Brooklyn; E. Bertram Pike, Pike Mfg. Co., Pike, N. H.

Maker's Name on Goods.

Following the lead of the manufacturers the joint session Friday adopted the following:

Resolved: That the association address the various departments of the government, stating it is the wish of this association that the government require all bids on specifications, as well as merchandise furnished under specifications to be on goods with manufacturer's name and brand only, and that the manufacturer's name, address and brand be placed on all articles furnished.

The discussion on this resolution in the manufacturers' association gave a number of speakers opportunity to emphasize the need of sending to foreign markets only the best goods obtainable, or, as Mr. Hargrave put it, "a little bit better than the best."

The manufacturers' association also adopted a resolution protesting against the passage of anti-injunction legislation and also against the "Hepburn bill" amendment to the Sherman anti-trust law, and this was later adopted by the three in joint session.

The Opening Sessions.

Separate executive sessions of the three associations occupied Wednesday morning and were devoted chiefly to routine matters. In the American Supply and Machinery Dealers' Association, the report of F. D. Mitchell, secretary and treasurer, showed a substantial gain in finances and in membership, the latter having increased from 126 to 140 during the year. Mr. Mitchell was highly complimented in the report of Chas. F. Aaron, chairman of the auditing committee. A resolution of condolence over the death of Capt. Smith, of the Smith-Courtney Co., Richmond, was adopted and a telegram of greetings was sent to President Briggs, of the Southern association. The most important action at this session was the changing of the constitution so as to leave with the executive committee the question of time and place of meeting, which heretofore has been in connection with the Southern association, by consti-

tutional provision. The fiscal year was changed to run from March 1. In the other associations the business transacted was of purely an executive nature. The Southern showed a net increase in membership of three and the National was also able to present a very encouraging report through A. T. Anderson, secretary and treasurer.

Addresses by Presidents.

At the joint open session Wednesday afternon, J. C. Miller, vice president of the Southern association, occupied the chair. George Puchta, of Cincinnati, president of the National Supply and Machinery Dealers' Association, was the first regular speaker.

Mr. Puchta referred to the widespread range of trade agreements in Germany and spoke of the trade association as exerting a deterrent effect upon the formation of trusts. Then he added:

The advantages of association are many. First of all, the opportunity is offered of personally knowing your competitor, with whom you have so much in common. After you know him, you regret such acquaintance did not formerly exist. Many mutual benefits and staunch friendships develop from such relations. From this come interchange of ideas; correction of abuses in trade; information regarding creddits; assistance in reducing and buying stocks; better methods of handling and distributing goods, and improved methods of accounting. By these methods every department may be analyzed and show the exact cost of goods and of doing business; better education of our salesmen and other employes, and, above all, of ourselves. A higher degree of business ethics is attained.

All of these things bring about good and profitable results. Intelligent competition, which is "the life of trade," is created and "unintelligent competition, which is the death of trade," is discouraged. * * * May this good work go on, with energy guided by wisdom; speeded on by good-will; tempered by justice to all; and it will add materially to our happiness, our experience, and our revenue.

M. W. Mix, of Mishawaka, Ind., president of the American association, spoke briefly in an extremely optimistic tone.

The place of Secretary Taft, who was scheduled to speak at this session, was taken by John Stryker Hord, collector of internal revenue for the Philippine islands. His subject was "The Opportunities for American Trade Within the Philippine Islands," and his address was principally a plea for mutual tariff arrangements, approaching free trade, with these islands.

Resale Prices.

The joint executive session Thursday morning was devoted principally to the reading of four papers of timely interest and to discussion of the points emphasized. The first of these was by F. A. Hall, of the Yale & Towne Mfg. Co., New York City, discussing, as a representative of the manufacturers, the subject of "Resale Prices." This was a comprehensive discussion of the subject's various phases, detailing the advantages of the system from the standpoint of manufacturer, dealer and consumer. It included a plea for only "good goods" at "right prices," coupled with a reference to the desirability of publicity of prices. This paper will be published entire in an early number of THE IRON TRADE REVIEW.

W. E. Gerow, of the Atlantic Supply Co., Jacksonville, Fla., a member of the Southern association, presented an exhaustive paper on the subject of "Salesmanship." This was a discussion of the origin and development of the art of selling to its present state and of the qualifications necessary for success in the salesman.

Following the reading of these two papers an extensive discussion developed. E. H. Hargrave, of the Cincinnati Tool Co., declared the keynote of both speeches to be this: "Do what is right, fair and honest." There are bound to be petty differences of methods, etc., between manufacturers and dealers, but the basis of all successful business is ultimately, "be honest." E. E. Strong, of Strong, Carlisle & Hammond Co., Cleveland, said that in the long history of trade many errors had been accumulated and that while many had been dropped, some still remain. He referred to the dealers' frequent policy of selling at any price he pleases as a source of great trouble, and pointed to the setting of a standard resale price on chucks as a pleasing instance of the ends for which the organizations are working, adding that many other products can be similarly handled. The dealers, he said, want to be honest, although some are weak. If other classes are added to those on which resale prices prevail, all must observe them.

On the question of the resale price, John G. Christopher, of the John G. Christopher Co., Jacksonville, Fla., said he favored it, but thought the percentage allowed by the dealers insufficient. This was largely due, he argued, to the manufacturer's ignorance of the dealer's cost of doing business, which varies largely according to locality. In Florida, for instance, dealers are compelled to carry large stocks, because of their distance from manufacturing centers. Traveling expenses of salesmen are large and the southern dealer needs from 15 to 18 per cent. The manufacturer, he thought, should set the resale price at such a point as would give the dealer a fair margin of profit over the average cost of doing business.

Some Points on Salesmanship.

On this subject Henry Prentiss, of the Prentiss Tool & Supply Co., New York, declared the good salesman must be "square, straight and an intelligent thinker." He emphasized the necessity of taking care, when booking an order, to have a distinct understanding as to terms, a point on which the average salesman is liable to be careless.

George Puchta, of the Queen City Supply Co., Cincinnati, emphasized the necessity for the dealer knowing just what it costs him to do business and what each salesman is making for the concern. He made a plea for a more accurate method of accounting, in place of estimating profits on the annual stocktaking. This same point was commented upon by Geo. F. McIntosh of the McIntosh Hardware Corporation, Cleveland.

A Plea for High Ideals.

The address by D. K. Swartwout, president of the Ohio Blower Co., Cleveland, entitled "A Plain Talk to Jobbers," was an earnest plea for clean methods and high ideals in business. He said that while so-called "gentlemen's agreements" for the maintenance of prices and for the correction of abuses are efforts in the right direction, they are of real value only when supported by right-minded men. "During the last few years," he said, "the light has been turned upon large undertakings, disclosing conditions so dishonorable as to seem almost beyond belief. Much good has doubtless been accomplished, but since lying and trickery and underhanded methods are not exclusively confined to interstate commerce, much still remains for business men's associations to do." Mr. Swartwout urged that more persistent efforts be made to create a demand for goods of quality by talking quality, instead of dwelling altogether upon price. He said that the great manufacturers whose names are now famous have been those who have considered quality first and price of secondary consideration. He declared that the all-important problem that confronts thoughtful business men of today is the training of men for better things. The urgent need is character building. "You must," he said, "sacrifice something for the improvement of

society by giving time and influence to making men better. I know of nothing so well suited to serve this purpose as for an employer to live an honest, clean life himself. We devote 21 years to developing a son, and are very well satisfied if, when he approaches manhood, he has a minimum of vices. Yet we are unwilling to give one minute a week to making a good man of the other man's boy, who happens to be in our office or shop. Employment in an honest atmosphere, among clean men, promotes honesty and cleanliness. If these associations would strike hard at dishonesty, their power for good could not be estimated."

Mr. Swartwout said that too many bankers have departed from honest and safe banking methods, and that the crying need is not the reform of the currency, but the reformation of some of the bankers who handle the currency. He briefly discussed the use of intoxicating liquors, and said that the business man should seriously consider whether it is not to his interest to use his influence toward the only absolutely safe plan—complete abstinence. "I am," he said, "a believer in clean entertainment and the greatest measure of good-fellowship in business, but John Barleycorn never secured an order and has lost many."

In conclusion, Mr. Swartwout said:

When we return to our homes, let us hoist above our place of business a flag. On that flag write conspicuously:

"Our Motto."

1.—A square deal for all.
2.—Fair prices for honest quality.
3.—Clean methods and clean men.

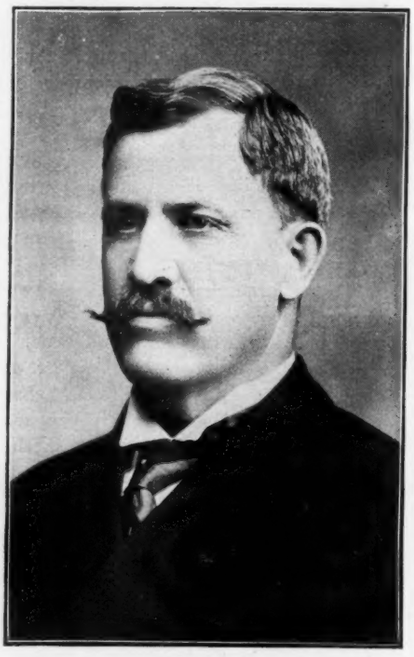
Then call our employes together and say to them, in the words of that great divine, the "Author of a Man Without a Country:" "And for that flag, boy—never dream a dream but of serving her, though the service take you through a thousand hells. No matter who flatters you, or abuses you, never look at another flag—never let a night pass, but you pray God to bless that flag."

But you say this is idealism, to which I reply: Everyone should have an ideal and no nation can expect to endure unless it cherishes an ideal. If we strive for ideals in business, ideals in our home lives, ideals in our conduct toward and treatment of all mankind, ideals in our religion, in the triumph of those ideals, we will enjoy life in its fullest sense and leave an heritage to posterity that will be worth while.

Value of Trade Organizations.

The address of W. M. Pattison, of the W. M. Pattison Supply Co., Cleveland, a member of the National association, after dwelling on the historic associations of the meeting place and the questions before the gathering, referred to the benefits of the trade organizaion as follows:

A membership in these associations is valuable for two reasons. You can value it strictly for the immediate and material benefits that it brings you, or consider it from a sentimental viewpoint, if I may use that expression, where its worth is measured by the ties of friendship. I certainly would like to feel that the success of these associations is measured by some other standard than an appreciation of the almighty dollar. Our associations have accomplished some definite tangible results. Possibly not so much as



D. K. Swartwout.

we would like, nor as much as some of our members anticipated, but still we have in a measure been successful. Through them we have been enabled to approach the manufacturers with a solid front and in many cases have secured material concessions. Many of the machinery manufacturers have increased their commissions and others will undoubtedly do likewise. Prior to the last six months, these manufacturers were so overwhelmed with orders as to make them somewhat independent, but conditions have changed materially since and it is quite possible that they will be more anxious to co-operate with us from now on. Other manufacturers have established resale prices, which action is in line with our pronounced policy, and this has added very materially to our profits on such lines.

While we value our memberships in these associations for the many material benefits received, we should value them even more highly for other and less material reasons. We should value them for the privilege of meeting our associates under these congenial conditions as we meet them today. We should value them for the friendships which are an outgrowth of these meetings, for with this friendship comes the knowledge that our interests are mutual wherever we may be located. We learn to know that our own success is in a measure dependent on the prosperity of our associates and the trade in general.

We will always have competition, so let us learn and practice friendly competition. Let us live and let live. It has been said that competition is the life of trade. This may have been true at one time, but today co-operation is the life of trade. We are learning that our interest is in concord, rather than in discord.

The Banquet.

Three hundred and sixty-five sat down at the convention banquet Thursday evening. North, east, south and west joined in singing America, Dixie, My Old Kentucky Home, and the Star Spangled Banner, and historic Richmond probably never had a better evidence of the thorough extent to which the nation is reunited. J. C. Miller, vice president of the Southern association, served as toastmaster, and responses were made by Charles A. Moore, of Manning, Maxwell & Moore, New York, on "Commercial Fraternity;" by J. M. Manley, of Cincinnati, on "Benefits Derived from Trade Organizations," taking the place of Commissioner Robert Wuest of the National Metal Trades Association; by John Garland Pollard, of Richmond, who spoke eloquently on "The Ladies," and by George Puchta, president of the National Association. Mr. Moore's address was a plea for honesty in business methods, as well as for the more active participation of business men in politics. He referred to the fact that only 5 per cent are permanently successful, told of some of the reasons for the many failures, deplored extravagance, discussed the resale price and closed with a bit of wholesome advice to the young men of America. His address was a feature of the convention.

Social Features.

Richmond well upheld the south's far-famed reputation for generous hospitality. The ladies of the convention were the guests of the entertainment committee on a carriage ride to points of historic interest about the city and Country Club. Souvenirs were distributed by several concerns, including the Lunkenheimer Co., Cincinnati; the Dodge Mfg. Co., Mishawaka, Ind.; the Wm. Powell Co., Cincinnati; the Warren Lubricant Co., Warren, Pa., and the Bradford Belting Co., Cincinnati. The success of the convention was largely due to the untiring efforts of Alvin M. Smith, secretary-treasurer of the southern organization.

THE IMPROVEMENTS TO THE PLANT OF THE TENNESSEE COAL, IRON AND RAILROAD CO. AT ENSLEY, ALABAMA

By Robert Thurston Kent.

The Tennessee Coal, Iron & Railroad Co. has under way at the Ensley, Alabama, plant improvements which comprise the practical rebuilding of the entire blast furnace and steel works equipment.

Although the building has been in progress for about 18 months, nearly 18 months' work yet remains to be done. The work already finished and contemplated comprises the rebuilding of four of the six furnaces; the raising of the general yard level of the plant; the building of a new electric power house and sub-station; the dismantling of the old Bessemer and open-hearth plant operating on the duplex system, and its replacement with a new steel works of the most modern type and of the heaviest construction, designed to make steel by the duplex process; the building of a new gas producer plant; the rearrangement and rebuilding of the rail mill plant to about double its original capacity; the rearrangement of the coke and ore bin system; the rearrangement of the yard track system, including the installation of a classification yard; the installation of a new pig machine, and the transfer of an old one to a central location; the replacement of the old boiler plant with a new one of Stirling boilers; and many other changes incidental to the principal ones listed above.

When the program is completed, there will hardly be a vistage of the original plant left and in its stead will be one of the largest and best arranged and most modernly constructed plants in the United States. The present campaign of reconstruction was inaugurated by the former management of the Tennessee company. When the United States Steel Corporation absorbed the Tennessee company the work was well under way. Such work as was partially done was completed and the continuation and completion of the work as planned by the former management have just been authorized by the Corporation.

The new work is of the most substantial character. Extremely heavy construction has been used in all

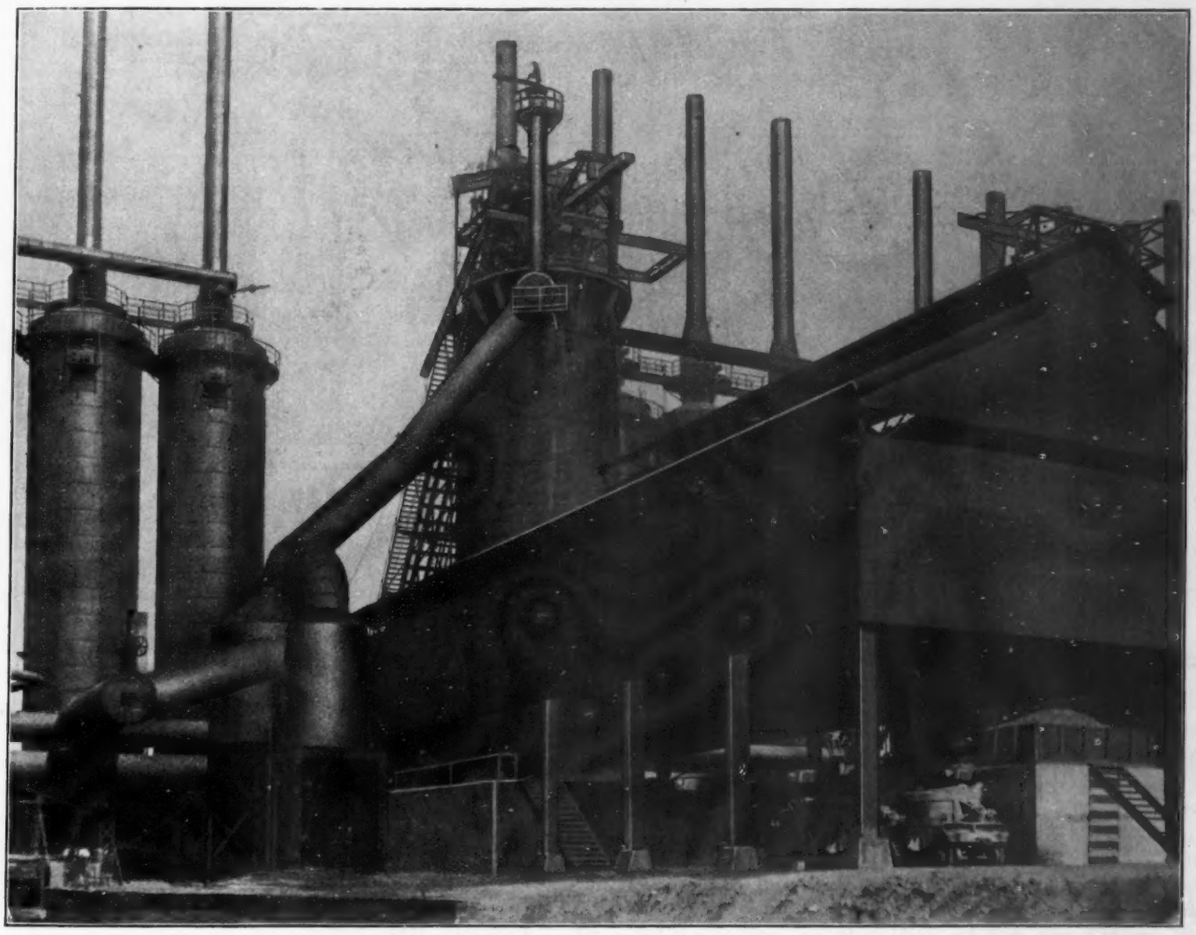


Fig. 1—No. 4 Furnace, Stoves and Cast House.

cases, the aim being to insure so far as possible against shut-down through the breakage of machinery. Another noticeable feature of the reconstructed plant is the ample room which has been allowed in all departments and the plentiful provision of trackage where material is to be handled in cars. This has been done to avoid any possibility of delay in the passage of material from one department to another and will be dealt with in detail in connection with the various departments described.

This article will discuss only the changes that have so far been made in the blast furnace and steel works department together with their auxiliaries, together with what is yet to be done at the blast furnaces. The changes in the rail mill will be the subject of a separate article, which will be published when these changes are completed. Having outlined above the general character of the improvements undertaken, we will now consider them in detail.

Blast Furnaces.

The present blast furnace plant comprises six stacks built at various times from 1887 to 1907. Furnaces Nos. 1, 2 and 3 are hand-filled stacks and, if the present program of improvement is carried to completion, they will shortly be replaced by modern skip-filled stacks. Furnaces Nos. 5 and 6 were completed and blown in about three years ago, while No. 4 furnace, the largest of the group, was blown in in June of last year. This stack has a daily capacity of about 350 tons, operating on the comparatively lean ores of the Birmingham district.

Reference to the bird's-eye view of the works on the accompanying insert sheet will show the location of these furnaces in regard to the rest of the plant. The plant has a general northeast and southwest direction and the blast furnaces are located at the extreme northeastern end. They are approximately in a straight line, although this is not strictly true. As furnaces Nos. 1, 2 and 3 are old and soon to come down we shall not pay particular attention to them. As furnace No. 4 is the largest of the group and is typical of the furnaces which will be installed to take the place of the older ones, a description of it will suffice for all. The new furnaces, however, are to be still larger, having a daily capacity of 400 tons. Furnaces Nos. 5 and 6 are similar to No. 4, although not quite so large.

The illustration, Fig. 2, is a cross-section of No. 4 furnace while the plan of the furnace and stoves is shown in Fig. 3. Reference to the drawings will show the furnace to

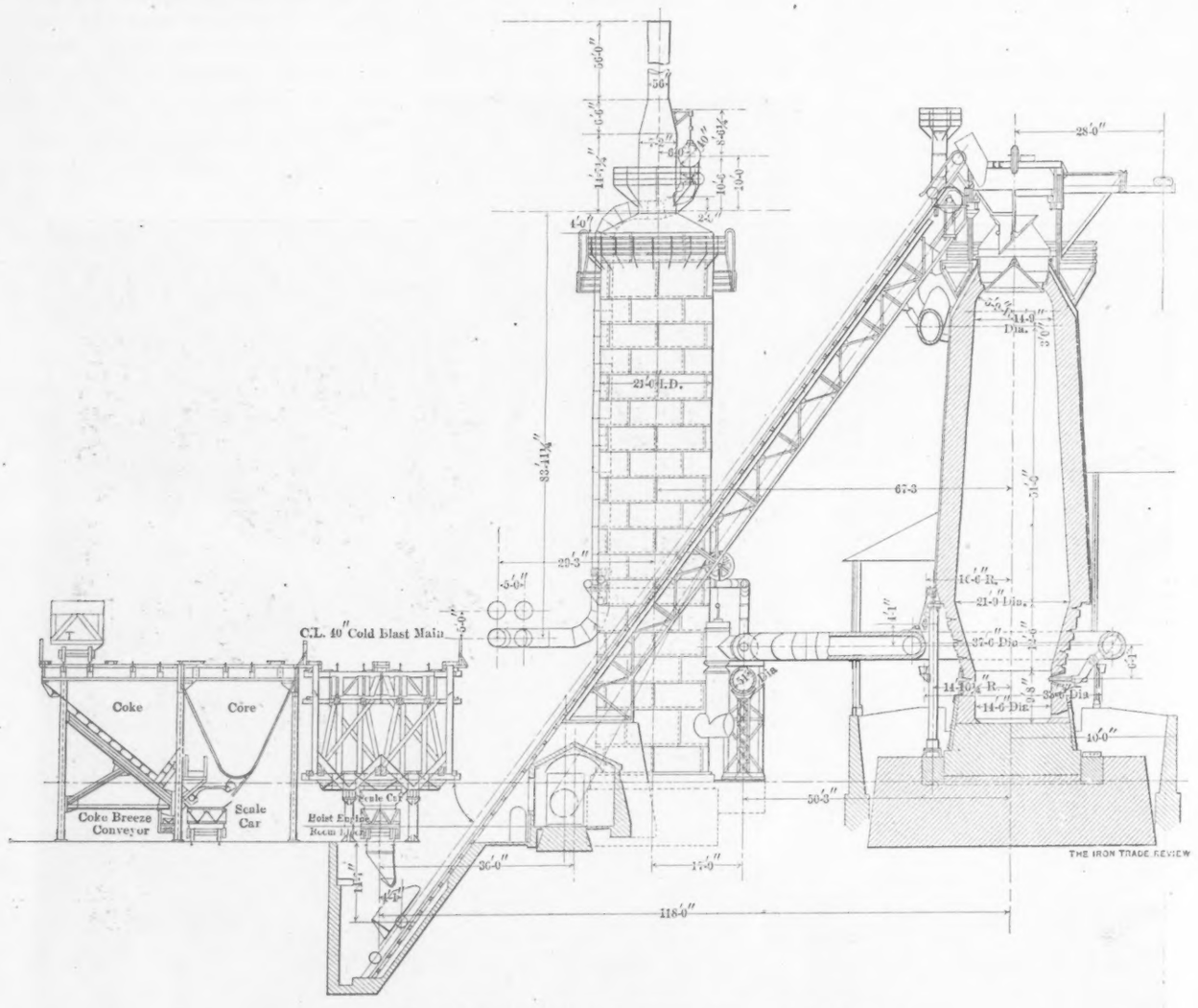


FIG. 2—CROSS SECTION NO. 4 FURNACE, ORE AND COKE BINS.

have a height of 84 feet 9½ inches from hearth to top. The diameter at the bosh is 21 feet 9 inches and at the hearth, 14 feet 6 inches. The diameter at the top just below the bell is 14 feet 9 inches. The furnace is supported on 11 columns and has 11 tuyeres. This furnace, as well as Nos. 5 and 6, is equipped with the Brown revolving distributor, and is constructed with a closed top. A double track deck bridge skip hoist is used for elevating material from the stock bins to the furnace. The skip cars are driven by Otis duplex hoist engines located under the skip bridge. The ore and coke bins used in connection with the furnaces will be described in detail under a separate heading.

Furnaces Nos. 4 and 5 are each served by four McClure 3-pass stoves. These stoves have a diameter of 21 feet and a height of 100 feet. The same type of stoves is used in connection with furnaces Nos. 1, 2 and 3. No. 6 furnace has four Kennedy 4-pass stoves, 21 feet diameter by 90 feet high. Two downcomers lead from the furnace, uniting in a single down-comer which is carried to the dust catcher. From the dust catchers of furnaces 4 and 5, a single common gas main is led to the stoves and to a battery of 12 Wickes boilers of an aggregate horsepower of 6,400. These boilers generate steam for the blowing engine plant of these two furnaces. Blast is furnished to the other four furnaces by a separate blowing engine plant served by a separate battery of Stirling, Cahall and Wickes boilers, located near the electric power station, and aggregating 7,500 horsepower.

One of the most important improvements effected has been the rearrangement of the pouring plant. The original furnaces had large cast houses in which were sand beds for the making of merchant pig. In the newer furnaces the cast house has been diminished until it is only sufficient to cover a comparatively small concrete pier on which are laid the cast iron runners delivering molten iron to four ladles which may be placed on either side of the casting house. The spur tracks running to the furnaces unite in a common hot metal track leading to the steel works and practically paralleled its entire distance by a second track, thus eliminating any possibility of a blockade.

The blowing equipment is as mentioned above, in two units, one of which serves furnaces Nos. 6 and 5 and is located a short distance southeast and between them. The blowing equipment comprises seven vertical, disconnected, cross-compound engines with steam cylinders 44 and 84 by 60 inches and blowing cylinders 84 by 60 inches. These were built by the Mesta Machine Co., Pittsburg. The blowing plant supplying the remaining four furnaces is situated at the opposite end of the line of blast furnaces and about on the center line of the row of stoves. The equipment here comprises 14 vertical, disconnected, cross-compound engines with steam cylinders 44 and 84 by 60 inches and air cylinders 84 by 60 inches, also built by the Mesta Machine Co. Two additional blowing engines to be installed in this house form one of the improvements contemplated. Steam exhaust and blast piping in this house have been rearranged.

For supplying water to the furnaces, a new water system has been built, situated at the extreme northeastern end of the plant. This comprises a pair of Prescott pumps to-

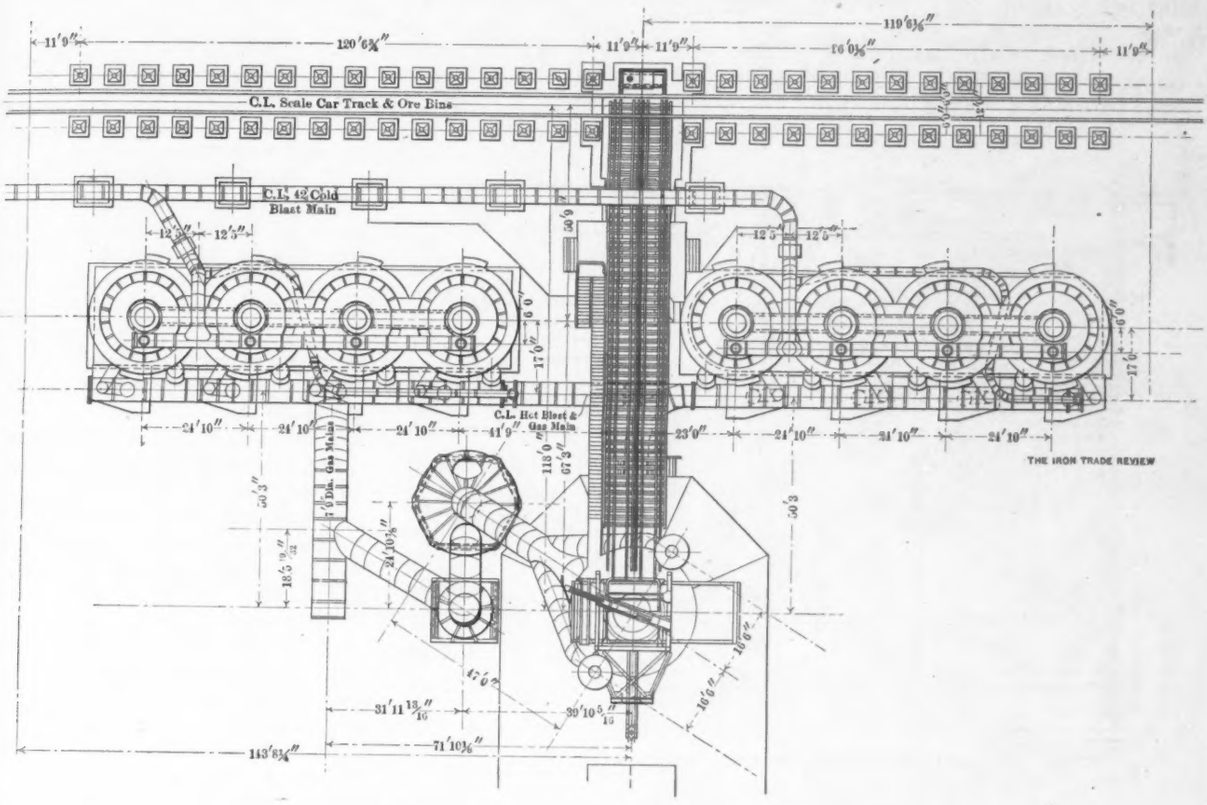


FIG. 3—PLAN OF NO. 4 FURNACE AND STOVES.

gether with a reservoir. On account of the scarcity of water for manufacturing purposes in the Birmingham district, it is of the utmost importance to conserve all the water possible. Accordingly the water after passing through the cooling plates of the other furnaces is cooled by suitable sprays, as far as possible, and then delivered to the reservoir from which it is drawn by the pumps and delivered to the stand-pipe to be withdrawn again for circulation through the furnaces.

In connection to the blast furnaces, changes have been effected in the pig casting machinery. There are now installed two Uehling pig machines, each of two strands. One of these is new while the other is an old one transferred from its former location at the extreme northeastern end of the plant. The present location of the pig machines is at the southwestern end of the line of furnaces and a little to the south of them. The machines are installed on a hillside, so that the two strands are practically level, with the hot metal end at the level of the yard tracks. Metal is conveyed to the machines in 25-ton ladle cars which are placed in position by an electric car spotter and tipped by hydraulic tilting cranes.

Ore and Coke Storage Systems.

One of the most important changes effected under the present program of improvement is the redesigning and reconstruction of the coke and ore storage system. The bins for coke and ore extend along the line of the furnaces for a distance of 1,072 feet. They are situated immediately in the rear of the stoves. Coke for use in the furnaces is derived from two sources: Bee-hive ovens at the opposite end of the plant and from the by-product plant of the Semet-Solvay Co., which immediately adjoins the Tennessee company's works on the northwest. Provision was therefore made for the storage of both kinds of coke in separate sets of bins immediately adjoining each other. Reference to the bird's-eye view on the insert sheet will show the relative position of these bins and the track system for handling coke from the ovens to the bins. It will be observed that coke can be brought from the Semet Solvay plant by means of two tracks which connect with the tracks over the coke bin at either end. Bee-hive coke can be brought in on two tracks connected by cross overs.

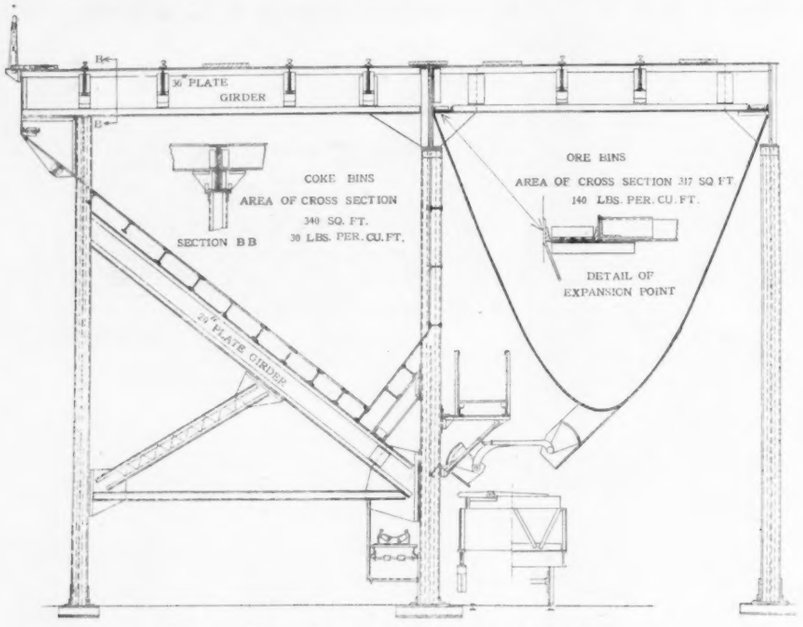


FIG. 4—CROSS SECTION OF ORE AND COKE BINS.

The illustration Fig. 4 is a cross section of the ore and coke bins. It will be noted that the brown ore bin is of the parabolic type with a cross sectional area of 317 feet and a capacity of 140 pounds per cubic foot. The coke bin adjoining it is of the ordinary 45 degree type, all being of steel construction. The floor of the coke bin is composed of steel plates carried on 12-inch, 31½-pound I-beams, which in turn rest on plate girders as shown in the drawing. Between this steel bin and the stoves is installed a wooden bin used for red ore. The relative location of the coke bins and ore bins is shown in the cross section of the blast furnaces, Fig. 2. This illustration also shows the method of transferring ore from the bins to the skip cars. Larry cars are used for this transfer, running on a single track underneath the coke and steel ore bins, and on a second single track underneath the wooden bin. Chutes erected at the proper angle deliver material from the bins to the scale car which is transferred by appropriate cross-overs to the track under the wooden bin located directly over the lower position of the skip car. The scale cars are each of 130 cubic feet capacity and were furnished by Pennsylvania Engineering Works, New Castle, Pa.

In connection with the ore storage, an ore yard with a total ultimate capacity of 150,000 tons is to be built. This will be immediately in the rear of the present bin system and will be spanned by an ore bridge carrying a 5-ton grab bucket. In addition to spanning the ore pile, it will cover the bin system also. One leg of the bridge will be carried on the trestle from which the bins are suspended.

An important feature of the coke storage plan is the system installed for screening and recovering coke breeze. The method of doing this may be understood by reference to the drawing, Fig. 5. Underneath the chute through which coke is delivered to the larry car is a screen with perforations of such size as to remove all the fine coke which it is undesirable to charge into the blast furnace. The tailings from this screen fall on a belt conveyor running the entire length of the coke bins. At the extreme northeastern end of the bins is a cross conveyor to which the main conveyor delivers. This cross conveyor delivers the tailings to an elevator extending to the top of a storage bin containing two compartments at an elevation of 49 feet above ground level. The elevator discharges to a perforated revolving screen with perforations ½ inch by 2 inches. Large size pieces which will not pass through this screen are delivered into one bin while the screenings pass into the other. The two bins have a capacity of 110 tons each. The screenings are removed and disposed of as waste product while the tailings are sold for domestic use or other purposes. Material may be removed from the bins and delivered into railroad cars on either of two tracks extending under or alongside the bin by use of a swinging chute as shown. The ore bins were built by the Pitts-

burg Steel Construction Co., Pittsburg. The coke screening machinery and conveyors are the product of the Jeffrey Mfg. Co., Columbus, O.

Steel Works.

The bird's-eye view on the insert sheet shows two open-hearth plants given as No. 1 and No. 2, respectively. The No. 1 plant is the old duplex works now being partially dismantled and comprises a 10-ton Bessemer converter working in conjunction with 10 50-ton open-hearth furnaces, of which five are now in operation. It also included a producer plant of 30 producers which, however, is being retained for the present and used in connection with the new battery of open-hearth furnaces. A mixer is also used in connection with this plant, but it is being removed together with the converter and furnaces to make room for the new extension.

The new steel works comprise two batteries of 100-ton open-hearth furnaces, situated at the southwestern end of the plant, with a building containing a mixer and the Bessemer converter plant between them. In the main open-hearth plant are four furnaces. In the other steel works shown as the extension to open-hearth No. 1, are two furnaces. It is proposed to duplicate the equipment in this portion of the plant making the open-hearth plant symmetrical around the Bessemer building as a center. The open-hearth furnaces are all tilting furnaces according to designs of the Tennessee company. It is proposed to install a battery of stationary open-hearth furnaces to take care of scrap and these will be located on the site of the present open-hearth No. 1. The present dimensions of the building containing the extension to open-hearth No. 1 is 229 by 151 feet. The building containing open-hearth No. 2 is 459 by 151 feet.

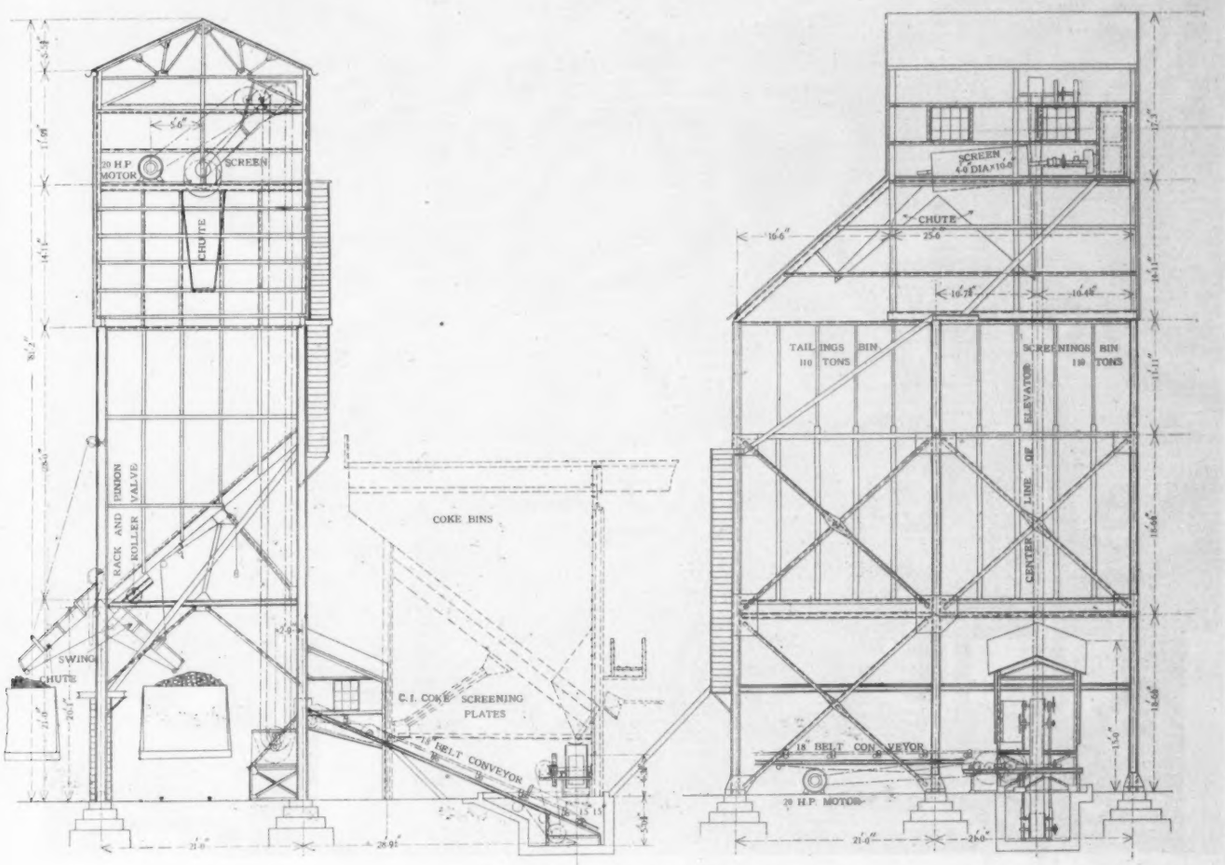


FIG. 5—COKE SCREENING PLANT.

Mixer Plant.

Iron is brought from the blast furnaces direct in hot metal cars and delivered to a 250-ton mixer installed in the Bessemer building 262 by 80 feet. The illustration, Fig. 7, shows a plan and cross sections of the Bessemer building containing the Bessemer converters and mixer and cupolas for scrap melting. Considered in its relation to open-hearth No. 2 the mixer is the first machine encountered. The machine was built by the Variety Iron Works Co., Cleveland, and is located approximately 100 feet from the converters and at elevation above yard of level 34 feet 7 inches. The Bessemer building is spanned by a 100-ton crane with a 25-ton auxiliary hoist used for changing the converters and handling ladles from hot metal cars, or other purposes which may be required. The mixer itself is carried on a heavy concrete foundation on which rest the base castings carrying the mixer proper. These base castings each support seven rollers on which the base of the mixer moves when it is tilted. Tilting is accomplished by means of a hydraulic tilting mechanism. The plans for extension of this department include the installation of a second mixer of 600 tons capacity similar in design to the present one.

The hot metal cars enter the building on a track at yard level, first passing over a scale on which the metal is weighed. They then run on to a 32-foot hydraulic hoist, which elevates the cars to the level of the mixer floor. On this floor is installed a hydraulic ladle tipper with a stroke of 9 feet 6 inches, which pours the

metal from the hot metal car into the mixer. On the opposite side of the mixer and at elevation of 14 feet 7 inches above the yard level is placed another floor which is at the proper level for charging the converters. A track laid along this floor serves to convey a 25-ton ladle from the mixer to the converter.

About 50 feet beyond the mixer and the opposite of a number of lines of railroad and communicating with the cupolas by means of a bridge shown in Fig. 7. The cupola iron runs are united and lead to a spout permitting them to discharge into the 25-ton ladle serving the converters.

Converters.

The new converter plant consists of two 20-ton converters built by the

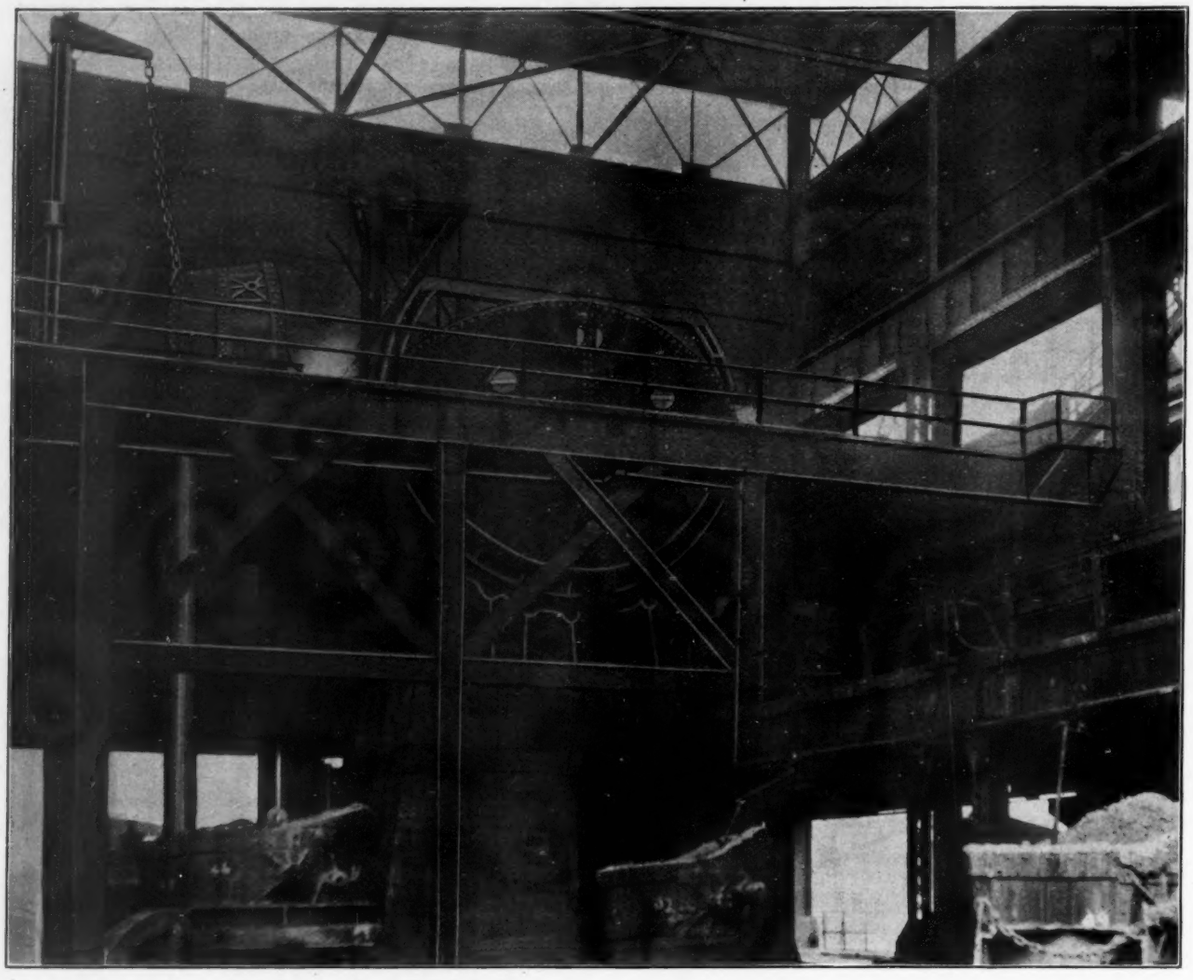


FIG. 6—250-TON MIXER IN BESSEMER BUILDING.

situated at one edge of the Bessemer building are two 10-foot cupolas for melting scrap. Blast is furnished these cupolas by means of two No. 10 Sturtevant motor-driven blowers. Slag is removed from them by means of a chute extending from the cupola casting floor down to the appropriate level to discharge into a slag car placed on tracks in the yards, as shown in the illustration.

Material to be charged to the cupolas is elevated to the charging platform level from the yard by means of a pair of elevators located some 125 feet distant from the cupolas on

Pennsylvania Engineering Works, New Castle, Pa., from the Tennessee company's designs. The unusually large size of these converters was adopted on account of various considerations. The duplex system being used introduces an additional cost in the steel production which it is desirable to reduce as far as possible, inasmuch as it is a burden which is not borne by plants operating on a straight open-hearth system. Losses are introduced in the process which may be enumerated as: Refractory losses, measured by the cost of relining; blowing losses, measured by the cost of furnishing blast to the converters, including the interest on equipment; direct losses due to the oxidizing of metal in the converter and also the blowing out by the blast of particles of iron which are thus entirely lost. These losses are in a measure counter-balanced by the fact that the steel does not have to remain in the open-hearth furnaces nearly as long as it does in the straight open-hearth system, resulting in a practical increase in the capacity of the open-hearth furnaces, which in the present case is estimated at about 100 per cent. Notwithstanding this great increase in open-hearth capacity, it is desirable to bring the converter losses down to a minimum.

The large converter vessel is essential to this reduction. With a large vessel the metal is shallow in the converter and a high air pressure is not required to force the blast through it. This operates to effect a savings in two ways: Its expense for blow-

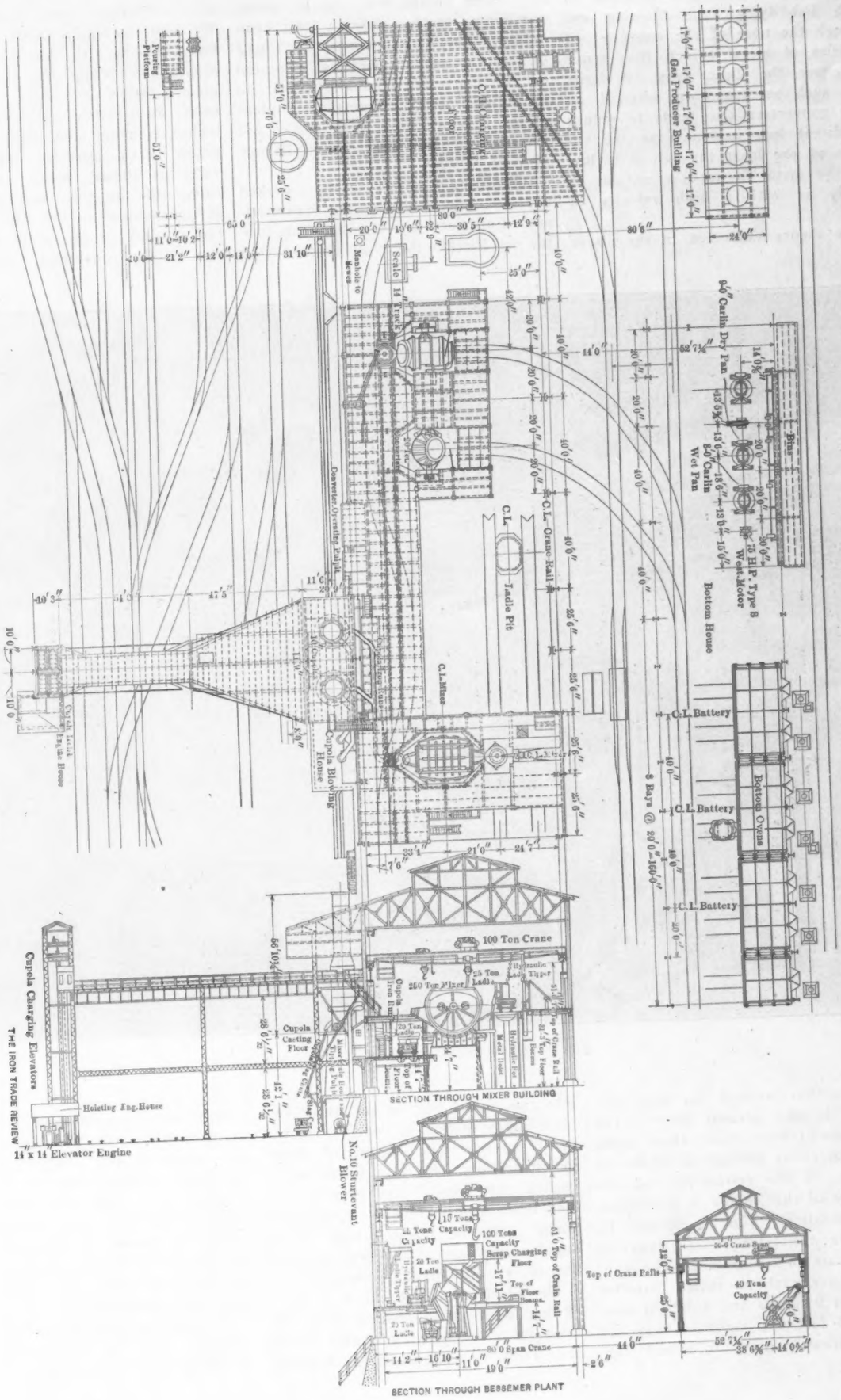


FIG. 7—PLAN AND CROSS SECTIONS OF BESSEMER BUILDING.

ing is not so great nor is there so much liability to the blowing out through the nose of the converter of particles of metal, which thus tends to reduce the direct loss. A large nose such as has been adopted on these converters also tends to reduce the direct loss inasmuch as the velocity of the blast through it is low and the metal is not carried out as readily as with a high velocity of blast.

The theory embodied in the above paragraph has worked out very successfuly in the present plant. The direct loss is very small, there being almost an entire absence of sparks at the nose of the converter, and the durability of the linings is marvelous. The illustrations, Figs. 9, 10 and 11, show the converter vessel, together with certain of its details. The converters have each an inside diameter of 12 feet 9 inches and a height over all of 23 feet 6⅜ inches. They are made extremely heavy to insure freedom from breakdowns and to render continuous service through long campaigns. They are operated by a pair of vertical racks operating a pinion on the converter trunnion similar to those used at the Youngstown plant of the Republic Iron & Steel Co. and described in THE IRON TRADE REVIEW of Nov. 9, 1905.

Interesting details have been worked out in connection with these converters. For instance, in order to reduce the air friction the blast is conducted into the tuyere box by means of two blast pipes instead of one, as is the usual practice. This feature is shown in illustration, Fig. 11. These mains branch just inside the trunnion and lead down to the tuyeres in the converter bottoms, being placed at an angular distance of 39 degrees from the center line of the trunnion.

The illustration, Fig. 10, is a detail of the blast pipes leading from the main from the blowing engine to the converters. As shown in the drawing, the converters are located about 40 feet centers, with the blast pipes leading to the inner trunnions, considering the converters in their relation to each other. The blast main from the engine is 30 inches diameter and divides into two mains, each provided with a stop valve as shown, which ascend vertically, side by side, and then branch at right angles to the two converters. On account of the great weight and size of the converters, it was necessary to make provision for movements in the converters due to wear and to expansion and contraction. This has been accomplished by the introduction of a ball and socket joint between the blast pipes and the trunnions, as shown in illustration, Fig. 10. The detail of this is shown clearly in the illustration and further comment is unnecessary.

A somewhat unusual feature in connection with the converters, is the provision for their repair. A spare

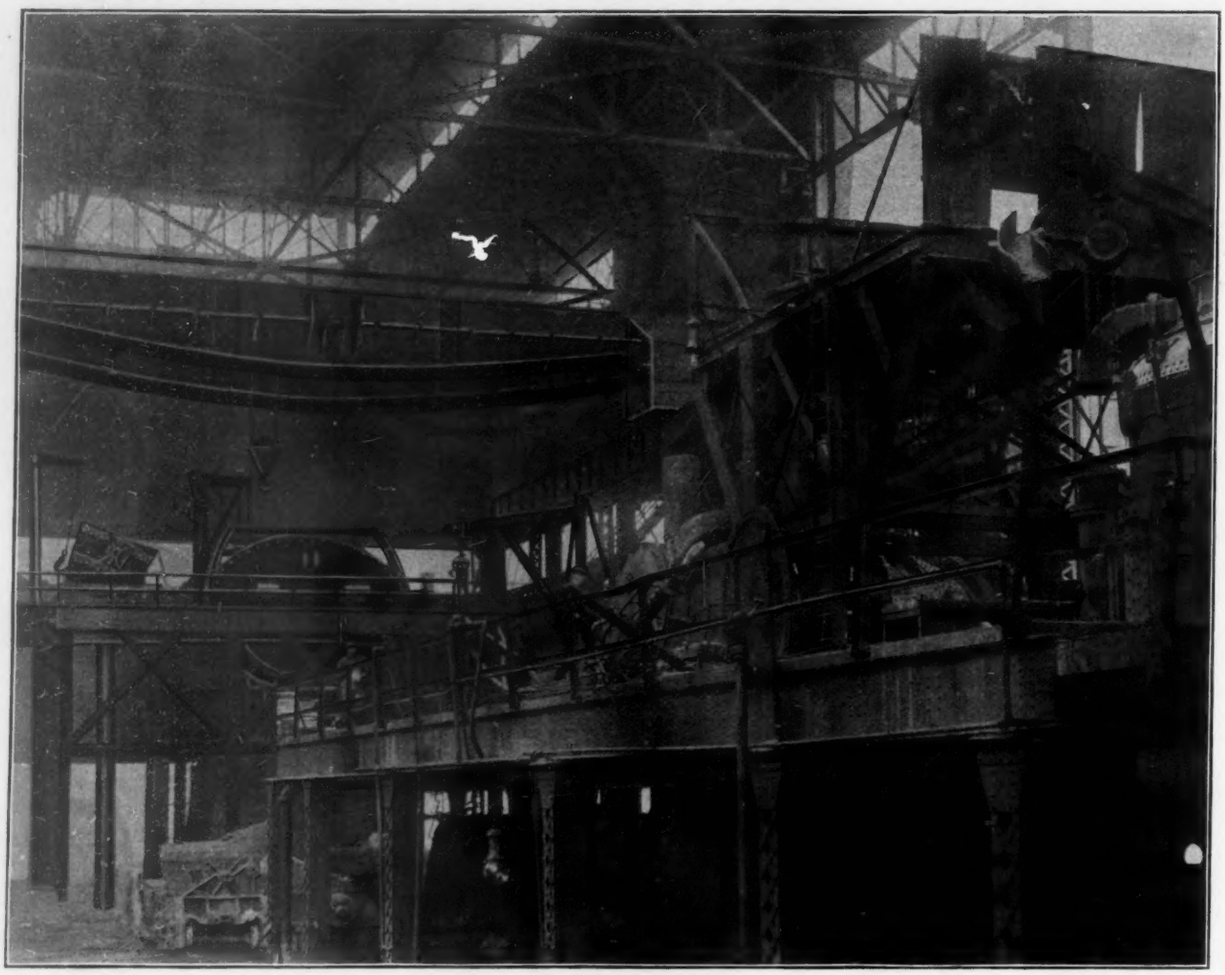
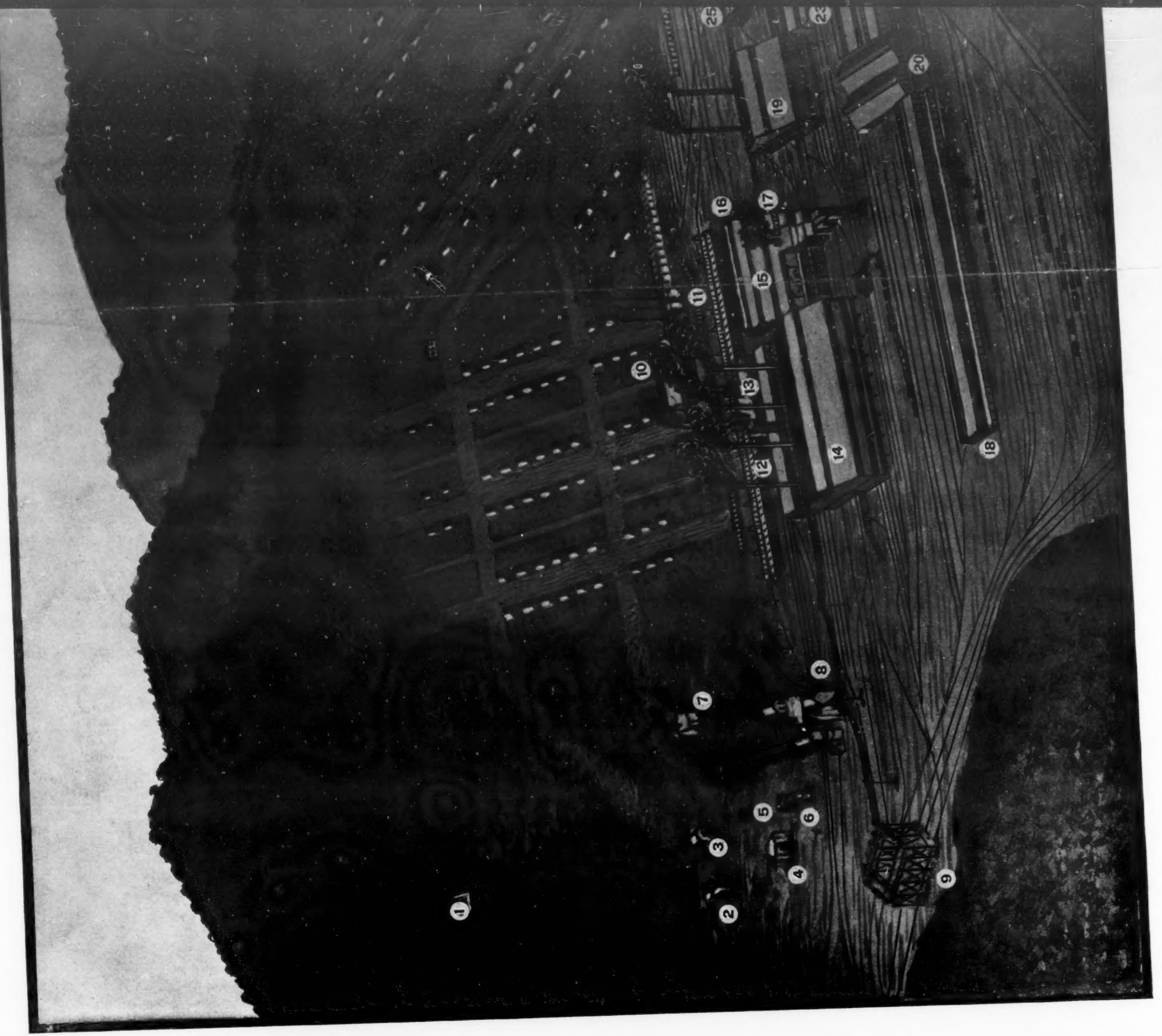


FIG. 8—CONVERTERS IN BESSEMER BUILDING.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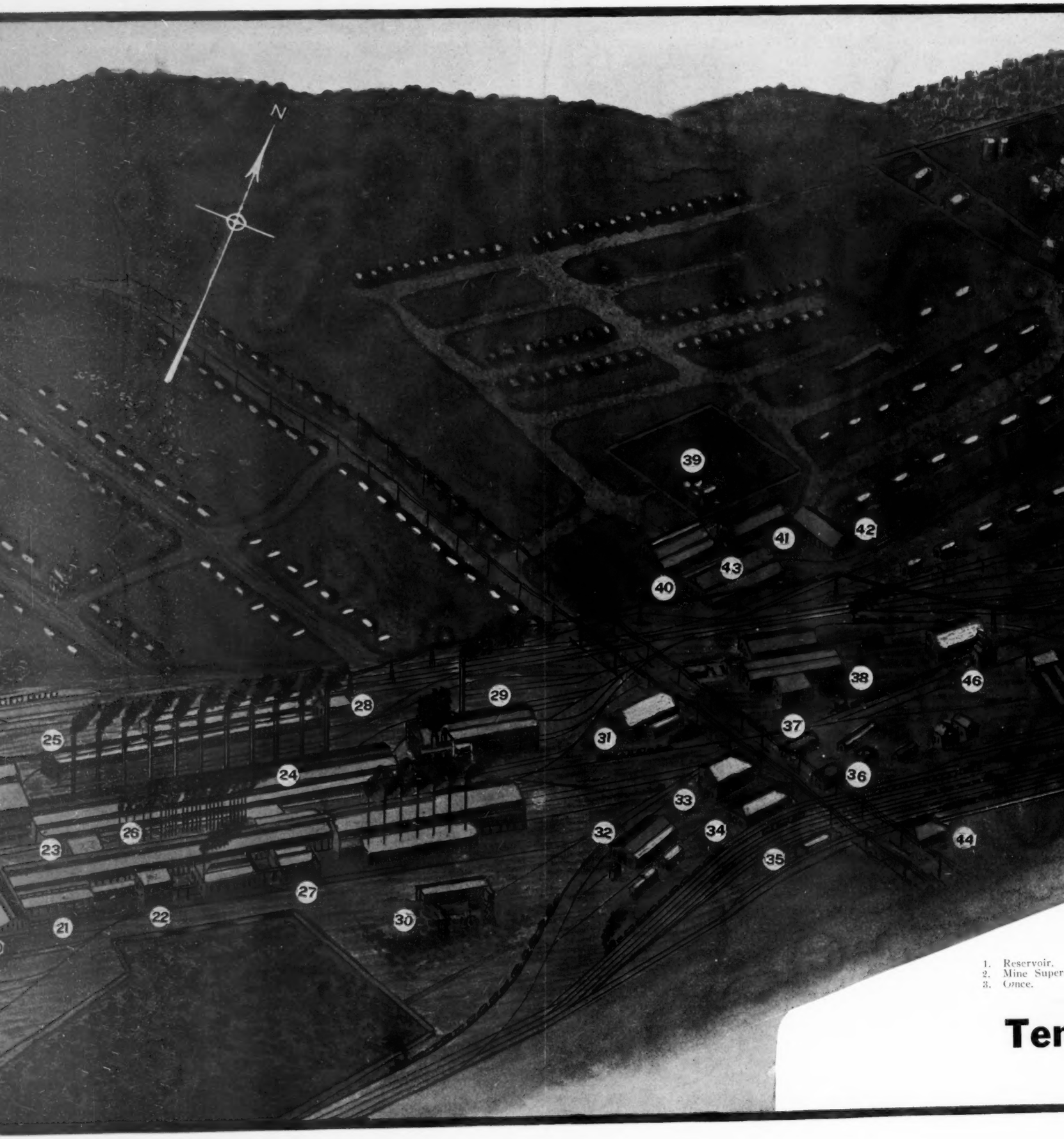

1. Reservoir.
2. Mine Super
3. Office.

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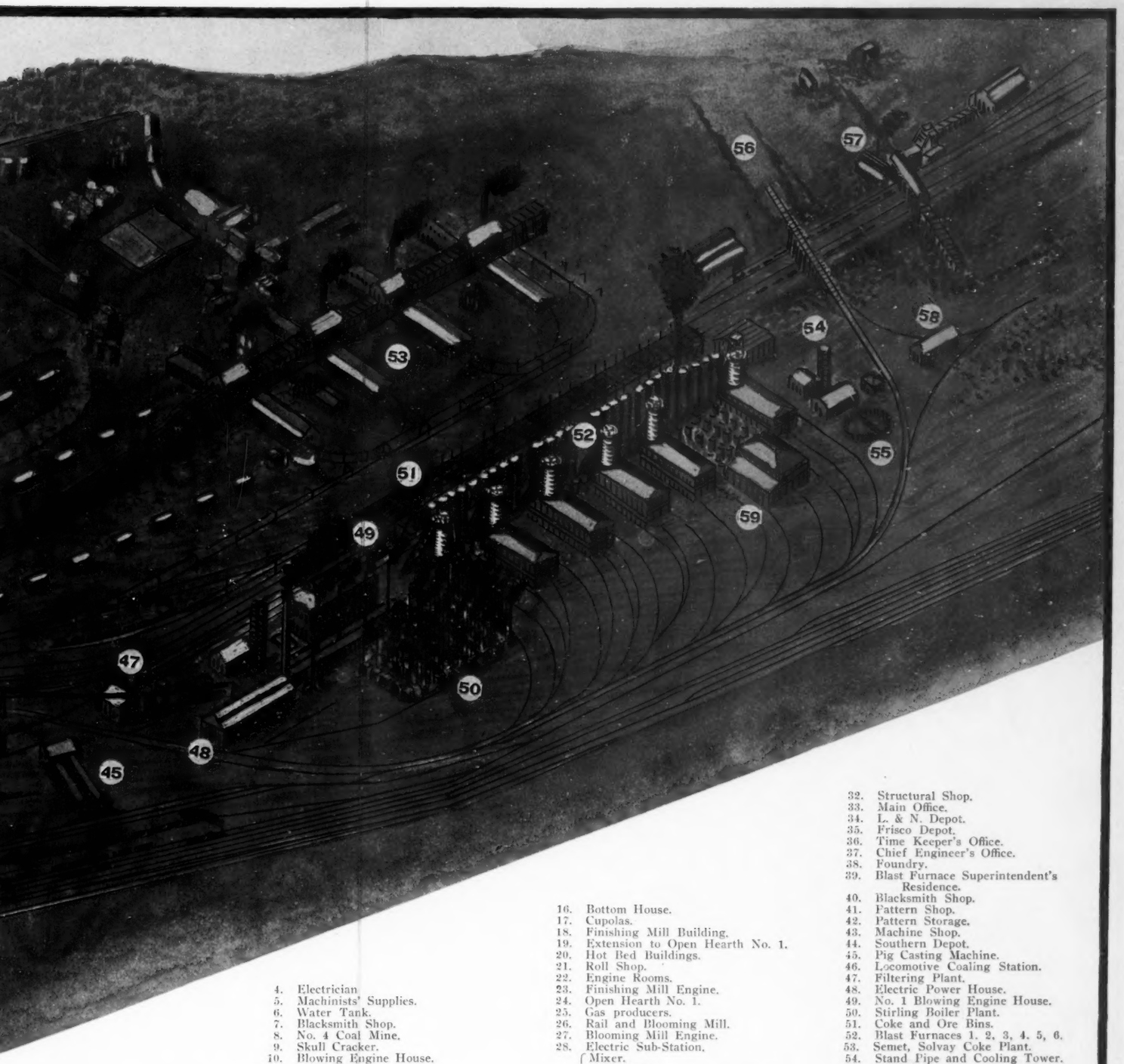


Reservoir.
Mine Superintendent's Residence.
Office.

4. Electrician.
5. Machinists' Supplies.
6. Water Tank.
7. Blacksmith Shop.
8. No. 4 Coal Mine.
9. Skull Cracker.
10. Blowing Engine House.
11. Coke Ovens.
12. Gas Producers.
13. Waste Heat Boilers.
14. Open Hearth No. 2.
15. Mixer and Converters.

16. Bottom House.
17. Cupolas.
18. Finishing Mill Building.
19. Extension to Open Hearth No. 1.
20. Hot Bed Buildings.
21. Roll Shop.
22. Engine Rooms.
23. Finishing Mill Engine.
24. Open Hearth No. 1.
25. Gas producers.
26. Rail and Blooming Mill.
27. Blooming Mill Engine.
28. Electric Sub-Station.
29. Mixer. Converter. Pit Furnaces and Stripper Building. Gas Producers.
30. Filtering Plant.
31. Store House.

32. Structural Shop.
33. Main Office.
34. L. & N. Depot.
35. Frisco Depot.
36. Time Keeper's Office.
37. Chief Engineer's Office.
38. Foundry.
39. Blast Furnace Superintendent's Residence.
40. Blacksmith Shop.
41. Pattern Shop.
42. Pattern Storage.
43. Machine Shop.
44. Southern Depot.
45. Pig Casting Machine.
46. Locomotive Coaling Station.
47. Filtering Plant.
48. Electric Power House.
49. No. 1 Blowing Engine House.
50. Stirling Boiler Plant.
51. Coke and Ore Bins.
52. Blast Furnaces 1. 2, 3, 4. 5, 6.
53. Semet, Solvay Coke Plant.
54. Stand Pipe and Cooling Tower.
55. Circulating Basin.
56. No. 3 Coal Mine.
57. Mine Power House.
58. Blacksmith Shop.
59. No. 2 Blowing Engine House.

Tennessee Coal, Iron and Railroad Company.

ENSLEY DIVISION

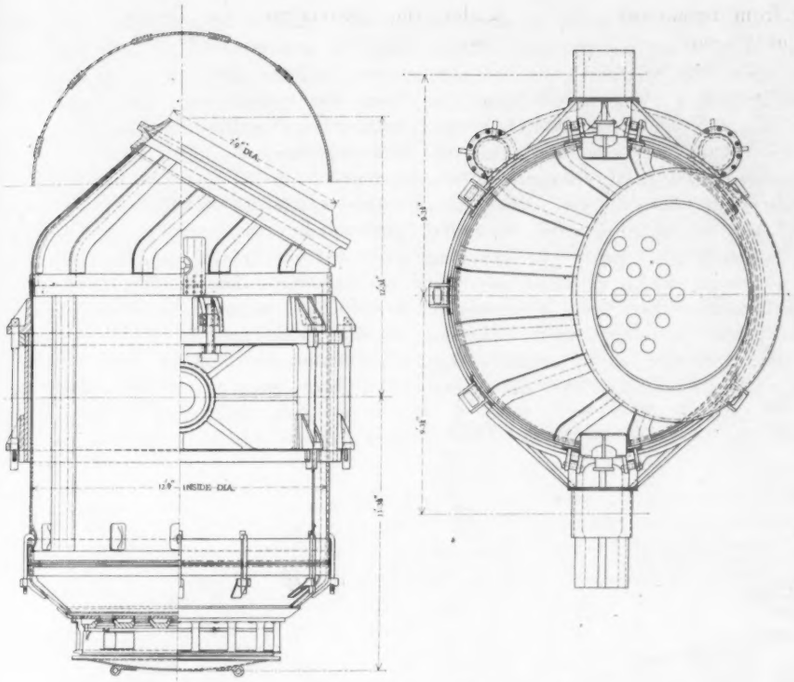


FIG. 9—20-TON BESSEMER CONVERTER.

vessel is always kept in the Bessemer building, and when repairs are needed on a converter, it is lifted bodily from its supports by the crane and replaced by the spare. By this method, the conversion plant is kept out of service only a very short time, and repairs to the damaged vessel can be effected at leisure, and in much better shape than would be possible if they were made with the vessel in place.

A bottom house 50 x 280 feet adjoins the Bessemer building on the northwest.

Blowing Engines and Hydraulic Plant.

Blast is furnished to the converters by an Allis-Chalmers horizontal, cross-compound blowing engine with steam cylinders 44 and 88 by 60 and air cylinders 84 by 60 inches. This engine was installed in a building 160 by 52 feet at the extreme western corner of the plant together with the hydraulic equipment furnishing power to the converter and open-hearth plants. The hydraulic plant comprises two Laidlaw-Dunn-Gordon pressure pumps, 27, 34, 34 and 7¼ by 30 inches, the steam ends of which are three-cylinder, cross-compound engines. These operate in connection with a 30-inch accumulator at 550-pounds pressure and are so arranged that one pump is in continuous operation, the other being in reserve and cut in automatically by the accumulator when the pressure falls to a predetermined point. Steam is furnished this plant by a battery of four Stirling boilers aggregating 2,000 horsepower, and operated by coal fired stokers, together with four Wickes boilers of 1,200 horsepower aggregate capacity. These boilers utilize the waste heat from the battery of coke

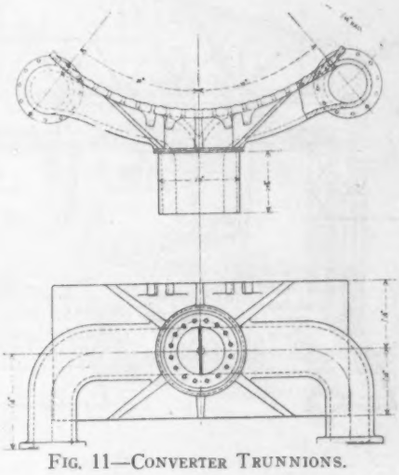


FIG. 11—CONVERTER TRUNNIONS.

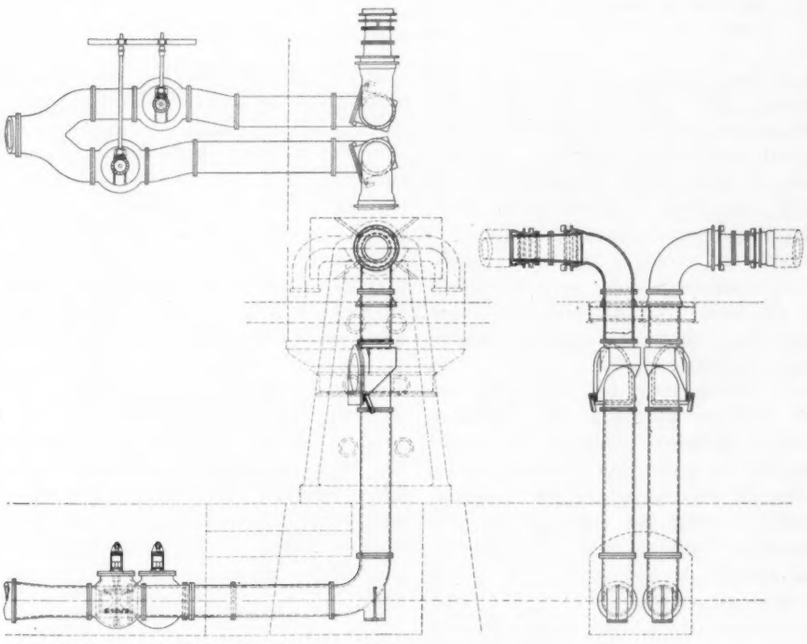


FIG. 10—BLAST PIPE FOR CONVERTERS.

ovens, located between open-hearth No. 2 and the blowing engine house. A 5,000,000-gallon reservoir on the hill immediately above the works supplies water to the hydraulic plant and insures continuous and ample pressure. The reservoir is of reinforced concrete, 190 feet diameter and 25 feet deep.

Open-Hearth Plant.

As stated above, the open-hearth plant is in two parts and when complete will be symmetrical about the converter building. Inasmuch as the two open-hearths will be duplicates, a description of one will suffice for both, and we shall confine ourselves to the plant shown on the insert sheet as open-hearth No. 2. This plant is located within a building 459 feet long by 152 feet wide. The building is of all steel construction of the heaviest type. It is shown in cross

section in Fig. 12, and in plan in Fig. 13. The furnace equipment comprises four 100-ton tilting open-hearth furnaces which will be described in detail below. A noticeable feature of this building is the ample space which has been allowed in all directions. Owing to the warm climate in which this plant is situated, ample ventilation is an absolute necessity. To provide this, unusual height was provided in the building and it was also made of great width. The extra width served the double purpose of securing ventilation and providing space for an almost ideal arrangement of tracks for the handling of metal to and from the furnaces. On account of the great width, heavy construction was necessary, which is particularly noticeable in the case of the crane girders, each of which weighs about 90 tons and has a span of 102 feet. The crane equipment comprises a 45-ton crane on the charging side, with a 10-ton auxiliary hoist, and a 100-ton, four-girder crane on the pouring side equipped with a 25-ton auxiliary hoist. Both were supplied by the Alliance Machine Co., Alliance, O. The buildings, together with the Bessemer building, were fabricated and erected by the Pittsburg Steel Construction Co., Pittsburg.

The arrangement of tracks on the charging floor is especially worthy of attention. The most radical departure from existent practice is the placing of a double track of standard gage in front of the furnaces. These are connected by cross-overs at each end, and also by a switch from the hot metal track from the blast furnaces. The idea governing this arrangement was that, inasmuch as the furnaces may be charged either with hot metal or cold material, it would be inadvisable to delay the charging of a furnace which required, say, hot metal because there were a number of cars loaded with cold metal standing before a furnace which required that material. Therefore, the hot metal track was laid directly in front of the furnaces and behind it the track for the accommodation of charging cars loaded with cold material. In the rear of both these tracks is laid a track for two Wellman-Seaver-Morgan, high type charging machines. These are standard machines with such modifications as were necessary to fit them for the unusually long reach required in spanning the double track in front of the furnaces. This was accomplished by extending the top girders, carrying the charging ram, a sufficient distance to permit the ram to reach over the two tracks.

On the pouring side of the furnaces, ample trackage has been provided as shown in the plan view. An interesting feature in this connection is the method of taking care of the slag. A slag car track runs along the face of the furnaces on the pouring side directly outside of the ladle pit. A spout is placed over the ladle leading to the slag car and slag is run directly from the furnace into the slag cars without any spilling on the floor or entering the ladle pit. Metal is discharged from the furnaces into 100-ton ladles which are handled by a four-girder ladle crane to the ingot molds stationed on tracks running through the building. The casting platforms are located against the wall of the building and removed as far as possible from the heat of the furnaces. The same is true of the operating platform on the charging side, these being also against the outer wall. Another interesting feature in connection with the building is shown in the illustration, Fig. 16. The platform extending around the pouring side of the furnace is laid as close as possible to the furnace. In order to permit the passage of the spout, the platform was interrupted and the interval bridged with two platforms somewhat after the manner of a bascule bridge. These are pulled up by means of winches, as shown, when it is desired to tilt the furnace. A trap door has been cut in these movable platforms through which ferro-manganese and other material may be charged into the ladle, the platforms acting as a shield to the man doing the charging.

The construction of the furnaces themselves is interesting. They are

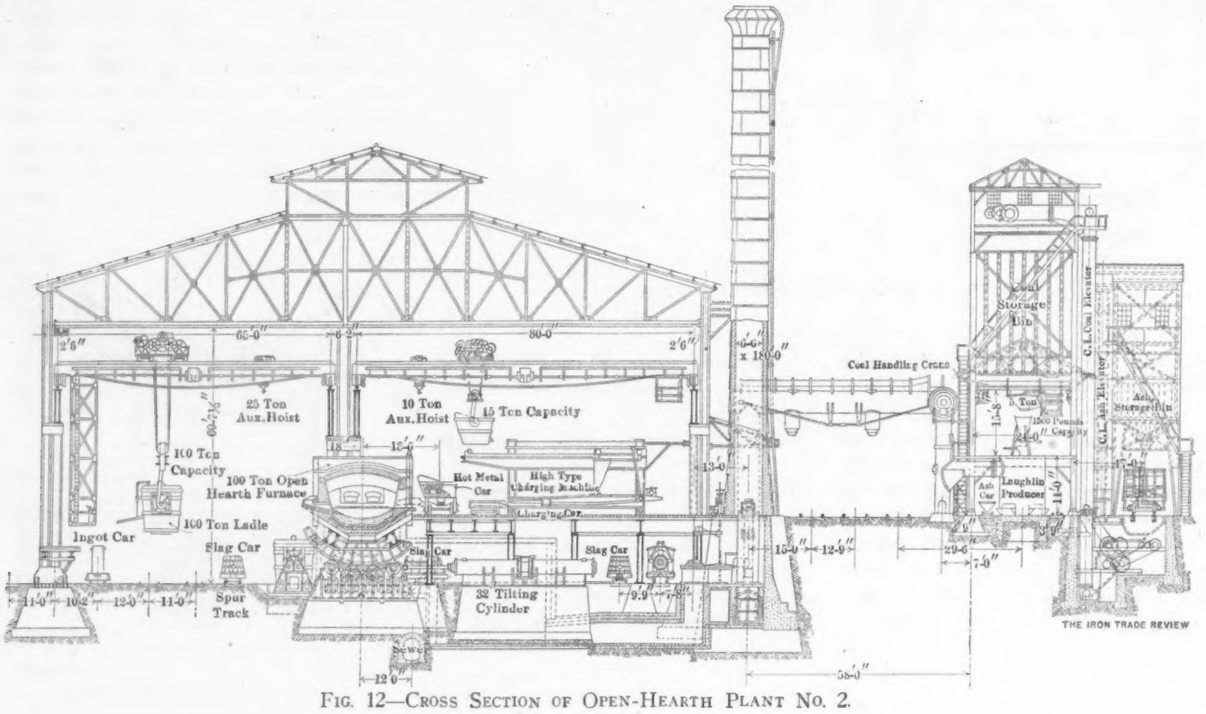


FIG. 12—CROSS SECTION OF OPEN-HEARTH PLANT NO. 2.

carried on two base castings each of which supports four rollers on which the rocker castings of the furnace proper travel. The base castings are made hollow so that the rollers may be dropped into them whenever a removal is necessary. They can then be rolled to either end of the casting and taken out. This feature is necessary in case there is any variation in diameter of the rollers so that one is either carrying more or less than its proper share of the load. The furnace itself is carried on two box girders extending from one rocker casting to the other, and on which the framework of the furnace proper is erected. This frame work consists of heavy I-beams suitably tied together and braced. Tilting of the furnace is accomplished by means of a rack resting upon rollers underneath the center line of the furnace. This rack meshes with a quadrant bolted to a casting extending between the two box girders carrying the furnace. The rack is operated by a horizontal 30-inch hydraulic tilting cylinder situated under the charging floor as shown in the cross section of the building. Each furnace is served by a self-supporting steel stack, 6 feet 6 inches inside diameter by 180 feet high. The brick work and structural material of furnaces were built by Alex. Laughlin & Co., Pittsburg, from designs of the Tennessee company. The hydraulic tilting machinery was built by the Mesta Machine Co., also from Tennessee designs.

Returning now for a moment to the arrangement for the disposal of slag, it will be noted that a narrow gage system of tracks extends under the charging floor, with spurs running underneath the furnaces. The slag cars may be placed in position on these tracks and slag poured into them through the slag spouts of the furnace. The cars may then be moved from the building through a subway to the yard.

An improvement has been effected in the construction of the air and gas ports of the furnaces. The center line of the ports has been made the axis of rotation of the furnaces. This results in stationary ports and those in the furnace itself always maintaining their proper relation to each other irrespective of the position of the furnace, and cold air is prevented from impinging on the ports, resulting in rapid contraction and destructive strains. The ports have also been so constructed that when the furnace is heated up to working temperature there is a minimum of clearance between the stationary ports and those in the furnace, reducing greatly the amount of cold air introduced into the furnace, with a consequent economy of operation.

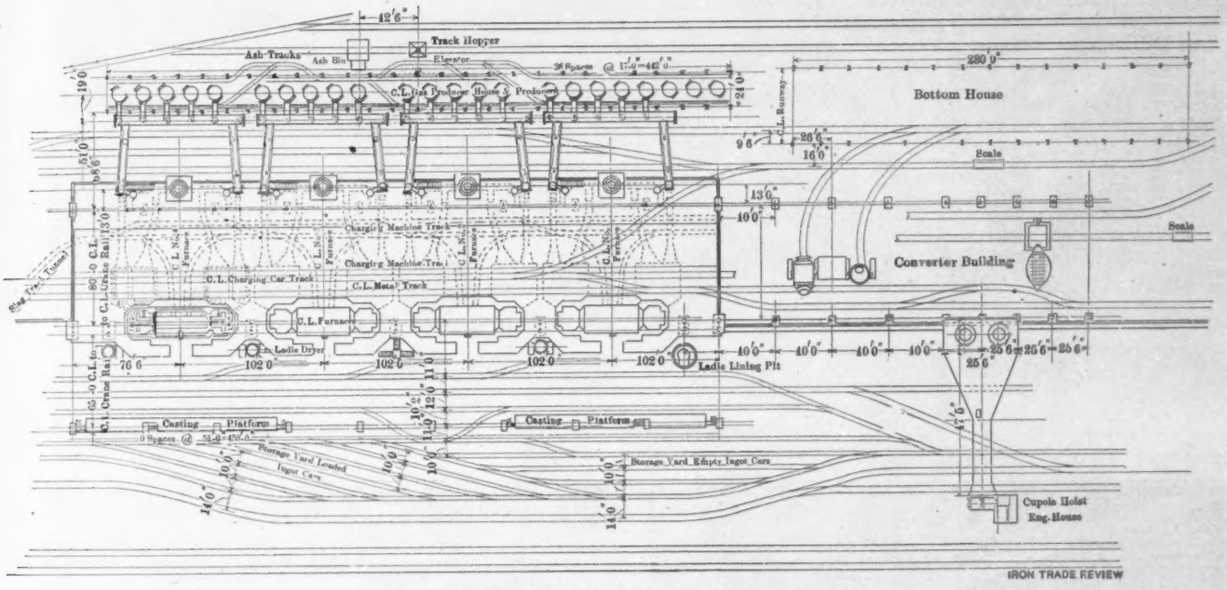


FIG. 13—PLAN OF OPEN-HEARTH PLANT NO. 2.

Producer Plant.

In connection with the open-hearth plant above described a new producer plant has been erected, it being located 58 feet northwest of the open-hearth and extending parallel to it. It is housed in a steel building, 442 x 24 feet. The plant comprises 20 producers divided into four groups of five each, each group serving a single open-hearth furnace. The gas mains have been located outside of the producer house, as shown in the sectional elevation of the open-hearth plant, Fig. 12. Dust pockets have been provided in the cross over mains to the furnaces and the gas main leading to the cross over has been given a downward flare at the junction of the up take in order to remove as much dust as possible from the gas before it reaches the cross over mains. This feature is shown in Fig. 17.

The arrangement for supplying fuel to the producers comprises two coal handling cranes traveling the length of the producer house which are supplied from a coal storage bin located at about the middle point of the producer building. These cranes each carry a five-ton bucket which discharges coal into 1,500-pound hoppers, situated one over each producer. Each hopper is provided with an independent gate through which coal can be charged to the individual producers, as desired. This is shown in Fig. 18.

The producers are all of the wet bottom type and are situated on the ground level. They were built by Alex. Laughlin & Co., Pittsburg. An ash car track extends along either side of the producer house on the yard level and ashes removed from the producer are shoveled directly into these ash cars and taken to an ash handling plant installed in connection with the coal storage for removal.

The coal storage is situated at the

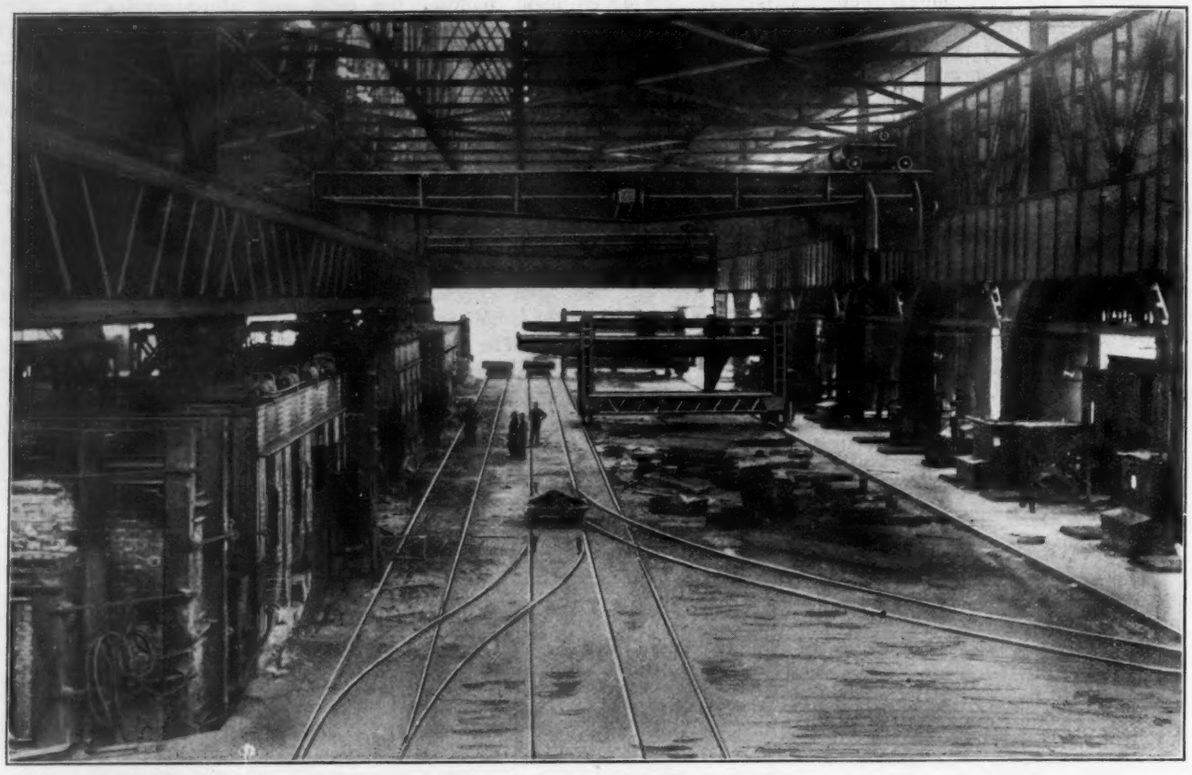


FIG. 14—CHARGING FLOOR, OPEN-HEARTH PLANT NO. 2.

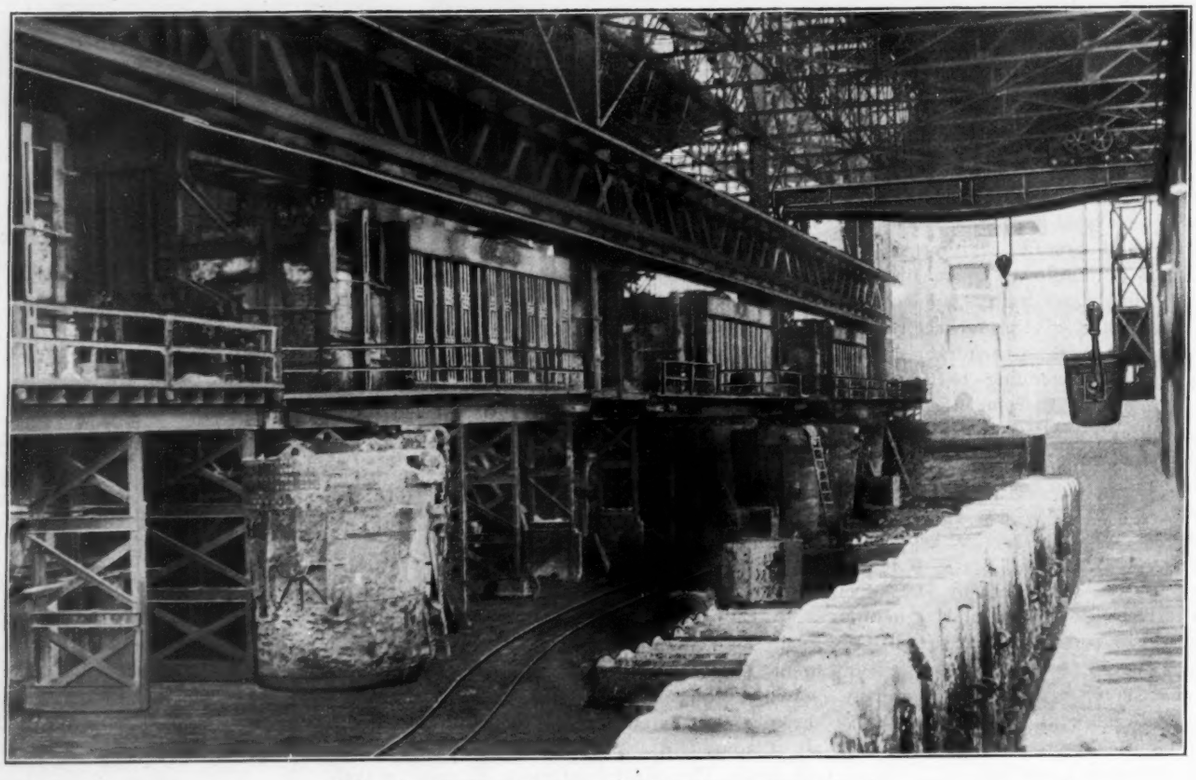


FIG. 15—POURING FLOOR, OPEN-HEARTH PLANT NO. 2.

middle point of the producer house and is filled by an elevator into which coal is fed from a track hopper on a track alongside the producer building. Underneath this track hopper are a conveyor, a crusher and a screen. Coal which passes through the screen is delivered directly to the elevator boot. Coal which is over size is carried by the conveyor through a pair of crusher rolls, which reduce it to the proper size and then delivers it to the elevator which carries it to the storage bin, whence it is moved by the coal handling cranes.

Spanning the tracks and situated a short distance from the track hopper, is an ash bin also served by a track hopper and elevator. Ashes from the producers are dumped into this track hopper, and elevated to the ash bin, whence they can be discharged into the cars which have been emptied of coal and have been pushed down under the spout of the ash hopper. This method eliminates one handling of the cars. The producer plant buildings, together with the coal handling system, were installed by Heyl & Patterson, Pittsburg, after designs of the Tennessee company.

Skull Cracker.

In connection with the steel plant, a skull cracker has been installed at the extreme southwestern end of the works. The skull cracker comprises an open frame steel structure, 150 feet long by 80 feet wide, spanned by an Alliance Machine Co.'s 50-ton crane 80 feet span and carrying a 25-ton auxiliary hoist. The crane is used for handling the tup, being equipped for this purpose with an Electric Controller & Supply Co.'s 50-inch No. 2, type S lifting magnet. A track scale also forms part of the equipment, being located just outside of the structure.

Auxiliary Plants.

The auxiliary departments necessary to a works of this size and character have been carefully planned and are complete in every respect. They comprise principally a machine shop, foundry, blacksmith shop, pattern shop and storage, structural shop, locomotive coaling station, ladle repair shop, water softening plant, etc. The machine shop is a steel structure 200 by 100 feet, located at about the middle point of the works in close conjunction to the blacksmith shop, pattern shop and foundry. The building is divided into three bays, the heavier tools in the center and the lighter tools in the side bays. A traveling crane with auxiliary hoist spans the center bay and in the side bays a unique crane service has been provided by means of revolving traveling cranes. These comprise essentially a traveling crane from which a carriage is suspended carrying a jib, the whole being possible of rotation through a complete circle. This arrangement is extremely convenient inasmuch as the heavier work can be placed in the machines direct by the crane without any handling or guiding on the part of the machine operators.

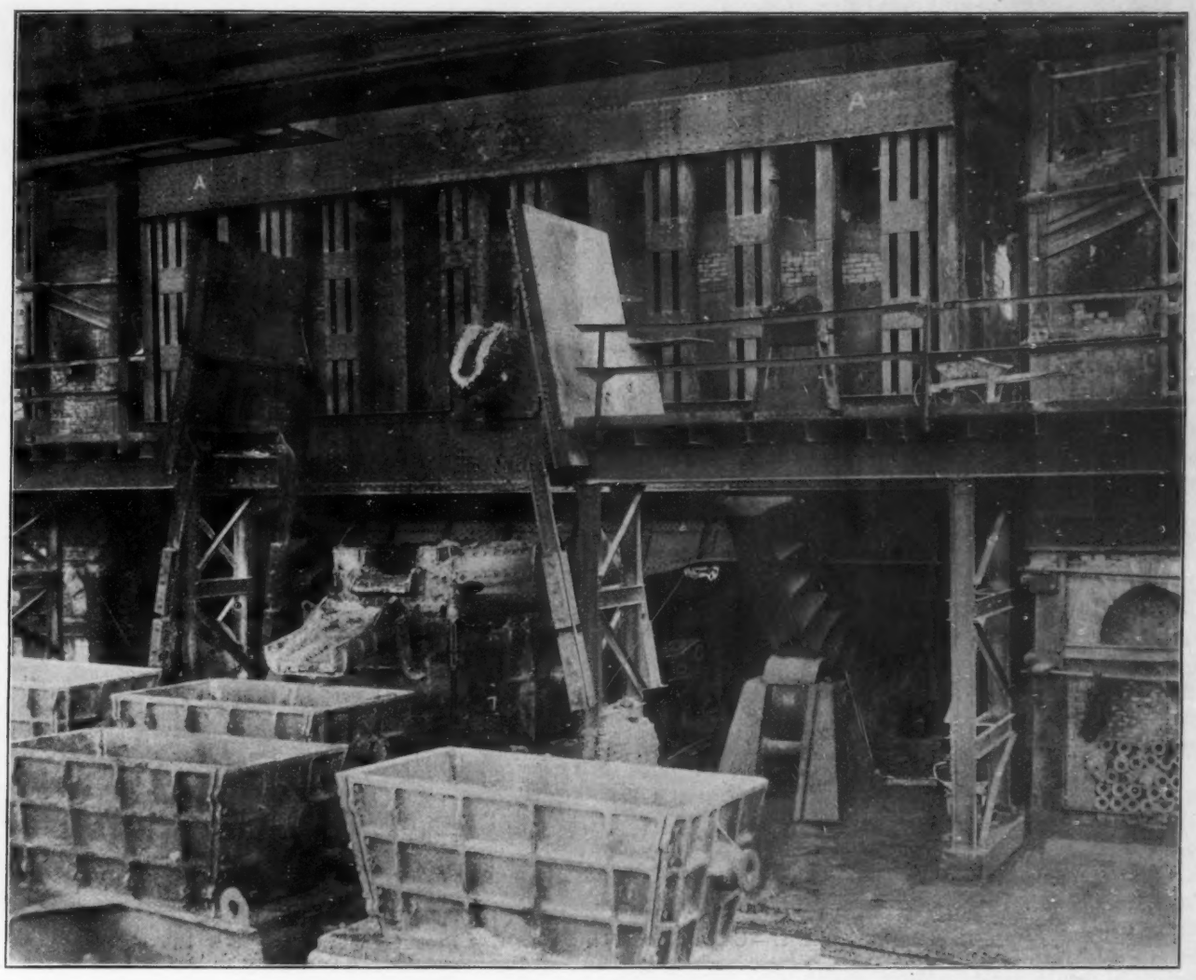


FIG. 16—POURING SIDE OF 100-TON OPEN-HEARTH FURNACE, SHOWING TILTING MECHANISM AND INTERRUPTED PLATFORM.

The more noticeable tools installed in this shop are a large planer, a large boring mill and several large lathes. The majority of the tools are belt-driven from line shafts carried on the building columns.

The blacksmith shop is a structure 140 by 75 feet arranged for forging the heaviest pieces needed about the works. Crane service is provided by a number of electric revolving jib cranes situated at convenient points. The forging equipment comprises principally steam hammers of varying sizes together with their heating furnaces. The largest steam hammer is of sufficient size to handle a steel ingot, while the other hammers are somewhat smaller. In addition to this equipment there is installed in the blacksmith shop a bolt heading and a bolt threading machine, situated alongside each other. This arrangement renders possible the completion of all bolts in practically one operation, inasmuch as it is not necessary to send the rough product to a second shop for threading.

The pattern shop is located adjoining the machine shop, and is 50 x 150 feet and is equipped with a full complement of wood-working tools. A fireproof pattern storage is in course of erection adjoining the pattern shop and will be sub-divided into sections, each about 50 feet in length, by brick fire walls. This building will contain no windows, all lighting being done by incandescent lamps. Damage from exposure fires is therefore impossible.

A foundry for the manufacture of steel castings is equipped with a 15-ton open-hearth furnace. The building is located to the southwest of the blacksmith shop and is 258 x 112 feet in dimensions. A structural shop 127 by 77 feet has been erected for taking care of all structural work about the plant, and is equipped with a full complement of tools for working of this kind of material. Its location is shown in the bird's-eye view.

Power Station.

A new alternating current power plant has been erected which generates current at 2,200 volts. The building is of brick 180 by 51 feet in dimensions and is located a short distance from No. 1 blast furnace. It is spanned by a 20-ton crane, built by the Morgan Engineering Co., Alliance, O. The generating equipment comprises three 600-kilowatt 3-phase revolving field Westinghouse generators. Each generator is direct-connected to a 23 and 40 x 42-inch cross-compound, Wisconsin-Corliss non-condensing engine, operating at 107 revolutions per minute. There is also installed a 75-kilowatt motor-generator set and a 75-kilowatt, 125-volt, direct-current exciting generator, which is direct-connected to a Buckeye high speed engine, operating at 275 revolutions per minute.

The current is transmitted at 2,200 volts and is carried by a duplicate three-wire system to the sub-station located at about the center point of the works, where it is converted to direct current and distributed to the various points required. The sub-station is a brick building 56 x 32 feet and contains nine 150-kilowatt static

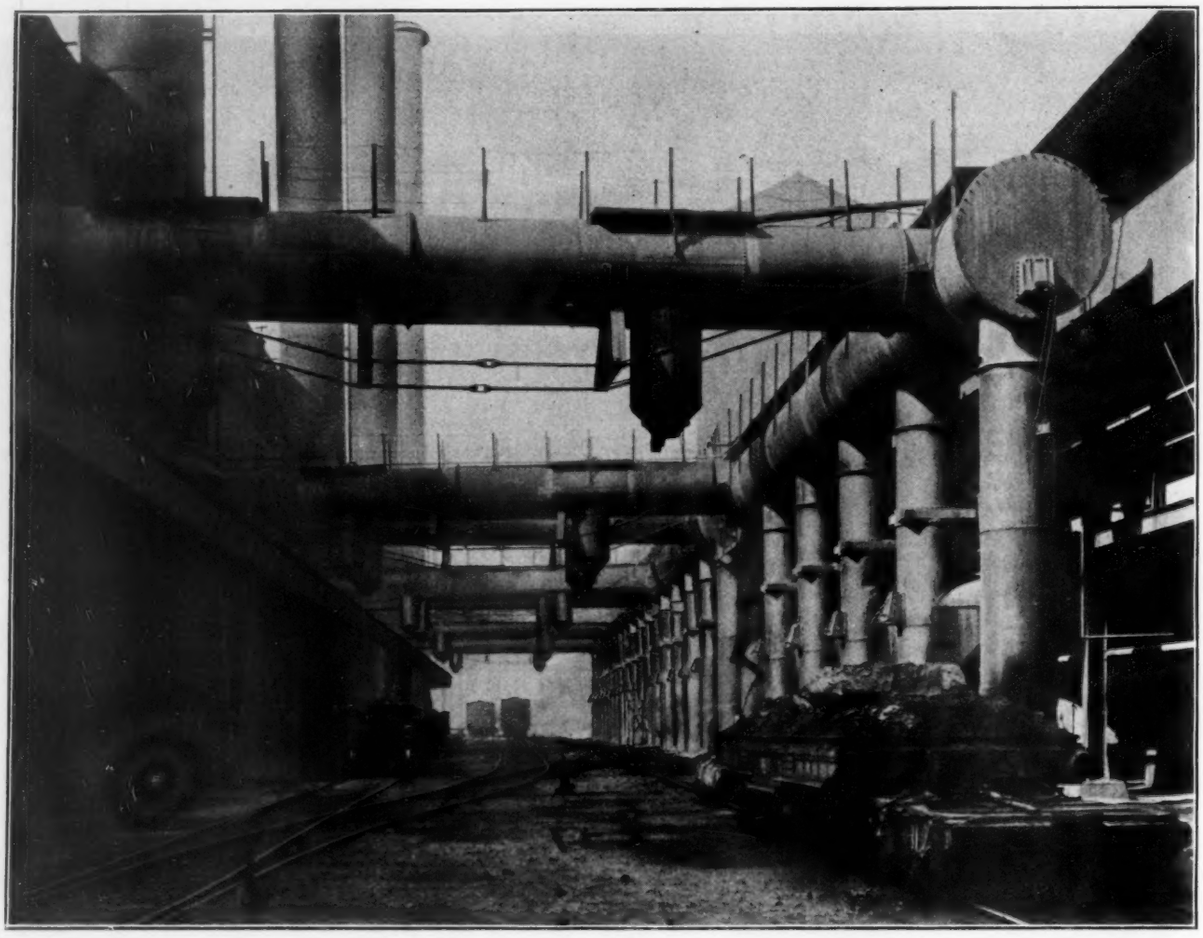


FIG. 17—CROSS OVER MAINS FROM GAS PRODUCER PLANT.

transformers and three 400-kilowatt rotary converters. These generate direct current at 250 volts.

Locomotive Coaling Station.

An important improvement effected in the yard system is the erection of a locomotive coaling, water and ash handling station, which is located a short distance from the pig casting machine, as may be seen by reference to the bird's eye view. This was installed by the C. W. Hunt Co., New York, and is arranged so that coal may be delivered to the locomotives from an elevated bin, while they are discharging ashes into a track hopper, whence they are conveyed by a cross conveyor to an elevator, which raises them to a bin in the coaling station, whence they may be loaded on cars run underneath the bins. At the same time water may be taken from the watering tanks, installed at the station. Under the former arrangement of the works, the locomotives had to receive coal and water and discharge ashes at three widely separated points, losing much time by the operation. The effect of this central coaling station has been equal to the virtual increase in equipment of two locomotives per day without the purchase of any additional equipment.

Coke and Coal Supply.

Coal is obtained from two mines, one at either end of the plant. Two batteries of coke ovens are in use, one of them being situated some distance away from the works, the other being on the property and visible in the bird's-eye view. This latter plant comprises a battery of 100 bee-hive ovens, divided into two parts in the center of which are four Wickes boilers, above mentioned as supplying steam to the converter blowing plant. In addition coke may be obtained from the Semet-Solvay works adjoining. The recent improvements authorized by the Steel Corporation include the opening of No. 13 Pratt mine near the works.

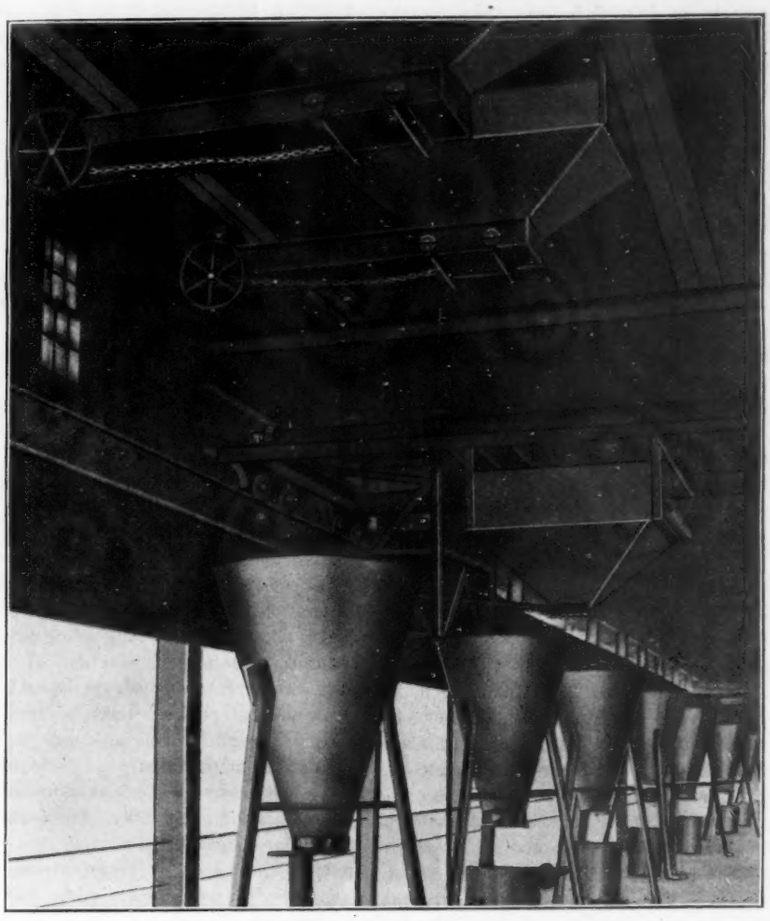


FIG. 18—INTERIOR OF GAS PRODUCER HOUSE.

Tennessee Co.'s Mining Properties.

The ore properties of the Tennessee company are being developed in a manner to keep pace with the improvements at the steel plant. In order to keep up with the increased demand for raw material at the blast furnace, the output of the mines must necessarily be greatly increased and steps are being taken to provide for this increased production at both the coal and ore mines.

The principal iron ore mines of the company are located on the ridge of hills known as Red Mountain to the south of Birmingham and extending west thereof for a number of miles. The first of the mines are located about six miles southwest of the city, and about eight miles in a straight line from Ensley. Communication is furnished between the mines and the steel plant by a branch of the Louisville & Nashville railroad, which ascends the hill by a series of switchbacks, the ruling grade on which is about 3 per cent.

The mines are driven in from the face of the hill by slopes from which cross cuts are made at the proper intervals. The vein outcrops on the hill and descends out an angle varying from 20 to 30 degrees from the horizontal. The present maximum depth to which any of the slopes have been driven is about 2,000 feet.

The ore properties are in two main groups on Red mountain, the easternmost, which is being actively worked, being about six miles long. This property is again divided somewhat by an undeveloped tract owned by an individual and by the mines of two other companies, which, however, comprise but a small proportion of the total available ore.

At present, there are six slopes in active operation, numbered from 7 to 12, respectively. Slope 13 is being driven further into the hill, being a development of an old working, and preparations are under way to open slope 14. A slope is also being driven between Nos. 9 and 10, being known as No. 9½. Exploratory work is being carried on on the western group of properties. At each mine the ore is taken out by 10 and 12-ton skips, which are loaded by tram cars in the mine. The skip is hoisted by a steam winding engine on the surface. The equipment and arrangement of the power house at each slope is practically the same, and a description of that at No. 13 slope, which is the most modern and which is well on the way to completion will suffice for all.

The power house is built of brick and located on a bench cut from the face of the hill. It consists of two

parts, boiler and engine plant, 42 feet x 102 feet and 68 x 88 feet, respectively. The boiler equipment consists of eight 150-horsepower horizontal return tubular boilers, fitted with stokers. These are set perpendicular to the face of the hill and a few feet distant from a coal bin built under a trestle above the boiler house. This bin comprises a concrete retaining wall at the back and a concrete and wooden wall at the front, built flush with the edge of the trestle and extending up to the track level. The trestle carries a spur from the main track of the Louisville and Nashville railroad and at the same level. Coal is spouted direct from the bins to the stoker hoppers.

The engine equipment comprises a Nordberg hoisting engine with cylinders 30 inches x 60 inches, 12-foot drum and two Allis-Chalmers, two-stage compressors, giving 5,000 cubic feet of free air per minute each. These are also set perpendicular to the face of the hill, with a difference in elevation of 8 feet.

The skip comes out of the slope on a tipple, extending out to the ore track and dumps into a bin, whence it is passed to a Gates crusher, which reduces it to a size suitable for use in the furnaces. It is then dumped directly into ore cars for shipment to the steel plant.

All the above work has been carried on under the direction of Frank H. Crockard, vice president anl general manager; H. C. Ryding, assistant to vice president and general manager; C. J. Barr, general superintendent Ensley division, and E. J. Best, chief engineer.

General Electric Earnings.—The annual report of the General Electric Co., for the year ending Jan. 31, 1907, was issued May 4. It shows total receipts of $72,484,988, an increase of $10,876,157. Expense, interest, etc., however, arose to $65,898,335, an increase of $12,717,346. The net earnings fell off to $6,586,653, which is $1,158,811 less than in the previous year. The total receipts now stands at $16,513,836, after adding the surplus left from dividends of $1,403,039, a decrease or $2,680,461. In making the report, President C. A. Coffin called attention to the taking over of the Stanley-G. I. Electric Mfg. Co., Pittsfield, Mass. He also spoke of the action of the directors in providing for future development at some point in the central west, and for this purpose purchasing 700 acres of land near Erie, Pa., at a cost of $232,301. However, the erection of buildings thereon is deferred for the present on account of the existing depression.

ELECTRIC POWER IN STEEL MILLS.

In THE IRON TRADE REVIEW last week was published a paper under the above title, by W. Edgar Reed. Lack of space prevented the following interesting discussion being presented at that time.

Discussion.

The discussion on this paper was, in part, as follows:

Mr. Berentsen: I would like to ask Mr. Reed to give some data about the fly-wheels used, as I believe they are the highest-speed wheels ever made for commercial use.

Mr. Reed: These wheels are to be run at a fairly high peripheral speed—I believe about 16,000 feet per minute. There are two 100,000-pound fly-wheels mounted side by side on the same shaft. The hub is a steel casting upon which is built a sheet steel rim made of No. 22, segmental punchings built overlapping and dovetailed to the arms of the spider. Heavy end plates and through-bolts clamp the punchings tightly together. The friction between punchings alone would be sufficient to withstand the force corresponding to about twice the normal speed of operation. The radius of gyration is about 62 inches and the fly-wheel effect—weight in pounds multiplied by the square of the radius of gyration in feet, equals 2,600,000. This laminated wheel is much safer in operation than a cast steel wheel of same diameter.

Mr. Cronemeyer: I would like to ask Mr. Reed if any attempt has been made to apply 2-phase and 3-phase alternating-current motors directly to the drive of auxiliary machinery. I understand that the starting torque of the alternating-current motor is not as large as that of a direct-current motor. To what is that due? Is that an inherent quality of the induction motor?

Mr. Reed: Alternating-current motors have been used extensively for driving the auxiliary apparatus in mills, but not to such an extent as direct-current motors. A series-wound alternating-current motor has practically the same characteristics and advantages as a series-wound direct-current motor. These motors have been used in street railway work principally, although some have been applied to cranes. The induction motor has frequently been used, operates satisfactorily and, when properly designed, any desired starting and running torque may be obtained. The characteristics of this motor are frequently compared with those of the direct-current shunt motor, which is not so well suited to crane and similar work as one having the characteristics of series winding. It would probably take more energy to go through a cycle of such operations than would be required by a series-wound direct-current motor. In some cases, however, alternating-current will be cheaper than direct, and all these conditions must be considered in order to determine upon the best installation. There are no special difficulties in applying alternating-current motors to cranes or other mill work and many installations are operating successfully.

Prof. Trinks: I admire electricians because they are so precise and so scientific; they can tell us, within ½ per cent, what the efficiency of an electric motor is. The mechanical engineer looks upon electricity simply as a convenient method of power transmission, comparable to a belt, a rope, or a shaft; but when you ask the mechanical engineer the efficiency of a line shaft, of a rope or a belt drive, you receive the reply: "I don't know." In this, the electrical engineer has a decided advantage; he knows, and tells everybody that his electric motor has an efficiency of probably 85 per cent, and the natural inference is that belts or ropes must have a lower efficiency because nothing is said about them. As a matter of fact, rope drives have about 95 per cent efficiency, depending upon the number of ropes and the style of drive. It is to be regretted that reliable tests of rope and belt-drive efficiency are so seldom made by manufacturers and transmission engineers. The question of efficiency being decidedly in favor of belts or ropes, it follows that electricity should not be used as the only means of power transmission, but that engineering judgment should be exercised in determining the power to be used.

An advance in one line stirs up the competitor; when electric hoists were substituted for steam, the engine builders re-designed their machines to effect a saving in steam. They built hoists driven by twin tandem compound condensing engines, with governors and suitable regulating devices to prevent the operating engineer from wasting steam. The result is that the new steam hoists show even better economy than the electric, and save a great deal in first cost. It must be understood, however, that these hoists are large units, probably 4,000 horsepower.

The question then arises: Will

there be a similar reaction in rolling mill work? The electric drive of rolls, like the electric drive of hoists, started on the European continent. Electric drives are installed to replace old worn-out steam engines, and of course there is quite a noticeable gain. Besides, the rolling mill engine has been sadly neglected, particularly the reversing type. All that was expected of it was that it run and never break down, no questions being asked about steam economy. But times are changing and the builders of rolling mill engines will have to pay greater attention to steam economies. I fought for reversing-engine economy and made a small beginning with the design of two twin tandem compound reversing engines. These engines have now been in operation 2½ years and have been copied extensively; 13 or 14 other engines of this type having been built in this country since then; but I cannot discover any radical improvement in any of the newer engines.

And in regard to tests of these engines; an indicator is attached and the probable steam consumption per indicated horsepower-hour is calculated. That is the extent of the test. Boiler feed-water tests are never made because of the work involved. Only three days ago the steam engineer of the company owning the engines mentioned, came to see me. I asked him, "Did you ever carry out that test which you proposed to make?" He replied: "No, we have never had a chance to set aside a separate battery of boilers for one engine." In this the electrical engineer has a decided advantage. He connects a voltmeter and an ampere-meter to his motor, and the story is told. The steam engineer cannot do this, and curves such as shown here tonight will never be obtained by the steam engineer unless new measuring devices are invented.

I do not think that a reversal in four seconds is anything extraordinary. When I read a paper on compound reversing engines, I was told by a gentleman in the audience that such an engine would never be a success because it would necessarily be sluggish in reversing. To satisfy myself on this point, I observed the behavior of one of the engines with a tachometer and a stop-watch and found that it reversed from 120 revolutions per minute forward, to 120 revolutions per minute backward, in 1.6 seconds; the engineer told me that he could make the engine reverse even faster than that, but it was unnecessary to do so because the ingot could not be brought back into the rolls in less time. The electric motor will have to pass through a stage of further development to equal or exceed that performance. I have repeatedly counted 14 seconds between reversals on single-expansion old-type reversing engines which would compare poorly with a modern electric motor reversing in four seconds. From this it will be seen that for large mills the steam engine is not yet obsolete, and I am positive that it can yet be improved for reversing mills.

For 3-high and for continuous mills, the electric motor certainly has strong features, making it preferable to the steam engine. But I believe that the future will see an increasing use of the gas engine coupled directly to large rolls. We should be able to design a gas engine for rolling mill work and, for example, connect it to a series of continuous mills by a rope drive. The gas engine should be in a separate house so as to be protected from the dust and cinders of the mill. It seems to be one of the traditions of rolling mill engineering that the engine must be in the same room with the mill. I have seen many rolling mill engines where the main bearing cap had just one big hole for a piece of suet, which was the only means of lubrication, and, in case of heating, a stream of water was turned into the bearing. The electrical engineer, observing these conditions, has wisely placed his motor in a separate room, free from dirt and dust. But why can we not do the same with the engine? And why can we not design a gas engine free from that objectionable feature of the present type, viz., that it is very economical at full load, but not much better than a steam engine at half of maximum load? Why do our foremost engine builders insist upon following, absolutely and blindly, the Nürnberg type? I venture to prophesy that the rolling-mill and blowing-engine types of gas engine will gradually leave the beaten path of the Nürnberg engine and will draw closer to the English type of scavenging engine which can be designed to allow of considerable overload. It will mean a considerable saving over the gas-engine drive with interposition of an electric transmission. The gas-engine-electric drive requires the engine, generator, motor, fly-wheel, then another generator, and a motor on the mill shaft; sometimes two or three motors on the mill shaft. In addition to all of this there is a lot of auxiliary apparatus, such as resistances, circuit breakers. I think the cost of all of this will run very close to three times the cost of a gas engine and rope drive.

I do not wish to give the impression that I am belittling electric transmission—far be it from me to do so; but I feel that there are limitations to its usefulness, and that we should learn to judge those limitations.

Mr. Reed: For comparatively short distances, at fairly constant torque and speed, and where the ratio of driving to driven shaft speed is comparatively low, a single transmission by gears, ropes or belts has a good efficiency. Under the conditions ordinarily encountered, however, such as variable speed of driven shaft, variable torque and load, large speed reduction, changes in direction or great distance of transmission which would require a number of mechanical transmissions in series, the electric drive is not only more efficient and convenient, but is more easily controlled than other methods, effects a saving in labor and power, and increases the production. In such cases electric transmission should be used, but it should not be assumed to be the best in all cases without consideration of others.

I do not wish it understood that I advocate electric drive in all cases, nor for all reversing or continuous rolls. I stated in my paper that in some cases it may be more economical to use steam engines for direct drive, and that the conditions seem most favorable to steam drive when cheap coal is available. If, however, blast furnace gas is used and the cost of fuel is practically the cost of installing gas washing and cleaning apparatus, where over half the available gas is generally wasted, then electric drive will, in most cases, be more economical than the steam engine. Again, if power is obtained from water falls or some other fairly cheap source, the electric drive should certainly prove economical. I believe about 45,000 horsepower is to be taken from the surplus blast furnace gas at Gary and used for driving machinery electrically.

If electric drive procures the design of a better steam engine for this work, it will have accomplished some good results. It seems to me that with steam engines, even of a much higher efficiency, the power could not be produced at the low figure obtained from blast furnace gas-engine-driven generators, unless very cheap coal is available. Where furnace gas is used for generating steam, the power derived from the steam engine is

only about 40 per cent of that which could be obtained from the same quantity of gas if used in gas engines. This means a great increase in the efficiency of the steam engine to enable it to compete with the gas engine.

It is better to keep electrical machinery as free as possible from dirt, dust, oil and water, and it would probably also be better, as suggested by Prof. Trinks, if steam engines were treated the same way, although the effects upon engines would not be so marked as upon electrical machinery. In reversing-mill drive more than one motor is frequently used in order to reduce the fly-wheel effect, and loss of energy in reversing. As the number of motors is increased, their rating and diameter decrease, so that the total horsepower is the same as that of one large motor having greater fly-wheel effect.

The chances look more favorable for the use of gas-engine-driven rolls, provided the engines can be designed to meet the requirements—large starting torque, and capable of being easily reversed and started under load. I have never seen such an engine as is required in a reversing mill, one whose speed could be controlled as required. In continuous mills, there may be some cases, with coal fuel, where steam-engine-driven rolls are more economical than electric drive; but when it is necessary to transmit the power from any distance or to distribute it over a considerable area, the cost is generally much less with electric transmission.

Prof. Trinks: The question of power required for rolling has always been enshrouded in a veil of secrecy; rolling mill men have been loath to impart information acquired by experience. In designing rolling mill engines, I found that lack of this knowledge was general. As a specific case, take an engine to drive an 18-inch mill. The material to be rolled may be soft iron or hard steel—one requiring nearly twice the power of the other—and may enter the rolls very hot, or rather cold; the draft of the rolls may be light or heavy, and there may be material in only one pass or in two or three at a time. All this makes variations of over 300 per cent in maximum power required. All this is not considered by the mill man, who merely specifies "an engine for an 18-inch mill." About all that can be done is to take the worst possible case and build an engine that will not be stalled even though the material gets so cold that the rolls or housings are broken. We should have more information on this subject and much credit is due the electrical engineers for their thorough experiments and investigations on similar steam direct-driven mills by means of the continuous indicator.

Mr. Cronemeyer: There is a movement under way to determine the power requirements of steel mills on a very large scale. Whether they will be published or not is another question, but by the time these experiments have been completed there will be available, for the parties who have undertaken them, very complete information of just what may be expected under different conditions. A rule quite commonly used, is: "For rolling steel, the requirements are 15 horsepower per inch of width for 25 per cent reduction and with stock traveling at 100 feet per minute." While at the present time the application of gas engines to reversing rolls is out of the question, perhaps it is not so much so as appears at first sight. In the year 1900, there appeared in *Engineering* the description of a reversing coupling which employs the coiling effect of a spring similar to the winding of a rope on a drum. The builders claim that they exert a very large torque and at the same time reverse quickly.

Mr. Haslam: I think it would assist the electricians' position if they understood the difference in rolling mill practice between a continuous and a reversing mill. In a continuous mill the ingots are at approximately a uniform heat, the amount of reduction, and consequently the amount of power required, is governed by fixed passes in the rolls, and it is not a very difficult thing to calculate the power required to drive them. The draft in a reversing mill is not fixed and is all in the hands of the roller; the only thing limiting the tonnage is break-down. The mill is built strong enough to break the engine, and the engine strong enough to break the mill.

Mr. Reed: A motor can be made as large as may be necessary, and if it is too small it will fail just as any other drive would do under the same circumstances. If the motor does not take care of the work it is due to a wrong application or insufficient power, rather than to the motor itself. The troubles experienced when motors were first used for driving auxiliary apparatus were largely overcome by making them larger, and heavier mechanically. This experience should be kept in mind in applying motors for driving rolls; it will be more expensive in first cost but cheaper in the end.

Mr. Lyons: In the reversing mill, the screw man is in complete control. If the piece of steel is at a higher temperature than usual, the rolls will be closed correspondingly, with the result that the mill will be stalled, necessitating reversal to release the steel from the rolls. This is quite easy with a reversing steam engine and is done very quickly, but with an electric drive, the circuit breaker would be thrown out, requiring some time to adjust or throw in the circuit breakers before the mill could be started.

Mr. Reed: If the rolls are screwed down too much and the motor blocked, automatic circuit breakers will prevent any abnormal overheating or burning out, the circuit being opened just as soon as the danger point is reached. Electric motors will carry the same overloads that steam engines will before being blocked, and can be easily and quickly reversed so that material may be released from the rolls before much cooling takes place. Under these conditions there is no reason whatever for a motor burning out and, with the usual safety devices, it is practically fool-proof.

Mr. Bole: It must be hard for the electrical engineer to obtain the ready prepared data which he would like, for they probably are very scarce. I believe it safe to say that until quite a recent date many a rolling mill engine has lived its active life without ever having had an indicator applied to it to show what it was doing. Such engines were compared with each other in terms of cylinder diameter, stroke, revolutions and boiler pressure, which while fairly suggestive of the maximum possible power which the engine was capable of exerting, gave little exact knowledge of the actual power being exerted at any less than a slowing-down load. In modern rolling mill engines, even where the indicator is freely used, its indications must be carefully interpreted, for much of the irregular and intermittent work may remain constant for only a single revolution of the engine. The indicator will of course show a mean effective pressure in the cylinder, which effect is modified by the inertia of the reciprocating parts, the fly-wheel, the speed of revolution at a particular instant of time, etc., so that it would be quite a job to accurately interpret all of this into terms of torque at the surface of the roll. One of the nice things about the use of electric transmission of power is the greater possibility of reading accurately, at any

moment, a record of just what is going on, and it is certain that as electric motors are still further employed in such work as this, there will eventually be accumulated a fund of very accurate and very valuable data for the use of future designers.

Mr. Skinner spoke of the indication, by electric meter, of the amount of current flowing in the motor during the act of shearing off a bloom. Even with the electric motor, the maximum torque demanded at the armature rim must depend in great measure upon the size and weight of the fly-wheel with which such shears are usually equipped, but the meter reading would be more accurate than any steam engine indicator card could be, and be read instantaneously.

Mr. Haslam: I think the exception taken to tests is not fair. I think if you will go to any well organized steel works in the country you will find, in the master mechanic's office, pretty carefully figured-out indicator cards showing the performance of the engines doing the different kinds of work. There are some isolated cases where such things are not known. There is that point Mr. Reed did not touch upon, the reversing of motors. The old practice was to use the smallest motor that could possibly do the work. Later they used larger motors, and the prevailing practice is to apply not one but two, three or even four, because putting the same current through two motors will reverse a piece of machinery in much shorter time than the same amount of current through one motor with a power equal to the two.

THE ALLIANCE ELECTRIC CANTILEVER GANTRY CRANE.

The cut shown herewith illustrates a 25-ton electric gantry crane with double cantilever ends, which was designed and built by the Alliance Machine Co., Alliance, O., for the Lake Shore & Michigan Southern railway for use in its freight yards at Toledo.

Owing to the constantly increasing weight of single pieces of fabricated structural material and also to the heavy pieces of machinery, castings, blocks of stone, marble, etc., that the railroads are constantly being called upon to handle, the question of whether a road has, or has not, the proper facilities for quickly unloading these heavy pieces at their destination often determines whether a certain road shall secure this freight business or not.

Probably one of the best means of loading and unloading freight is by means of the electric traveling cantilever gantry crane. The crane can unload a car of freight in an extraordinarily short time and thus tends to relieve congestion in freight yards. In times when cars and tracks are in great demand and the consignee is not ready to receive his heavy freight, the cars may be unloaded and the contents piled up alongside the railroad tracks, and when the consignee is ready to receive his freight it can then be loaded on his trucks. The entire expense will usually be considerable less than demurrage charges on the cars.

This type crane should span at least two lines of railroad tracks between its supporting legs and leave ample room for a wide double wagon roadway between these tracks. The supporting legs should be built A-shape, but should have a clear opening between the diagonal members as is plainly shown in the illustration, thus permitting the crane operator, for instance, to pick up a piece of freight from a car on any of the railroad tracks and transfer it along the bridge, and, if necessary, through the supporting legs and on to one of the cantilever ends of the crane and deposit it on the delivery trucks. The cantilever ends should be long enough to reach over one railroad track and one wagon roadway, and the supporting legs of the crane should be designed so that no part thereof projects more than 24 inches beyond center of the runway rails, in order that proper clearance may be maintained between the railroad tracks. Local conditions, of course, may vary the relative location of railroad tracks and wagon roadways.

ALLIANCE ELECTRIC GANTRY CRANE.

The crane should be supported on not less than eight track wheels mounted on equalizing trucks so as to permit the crane to accommodate itself to irregularities of the runway tracks. The cranes are built for direct or alternating current.

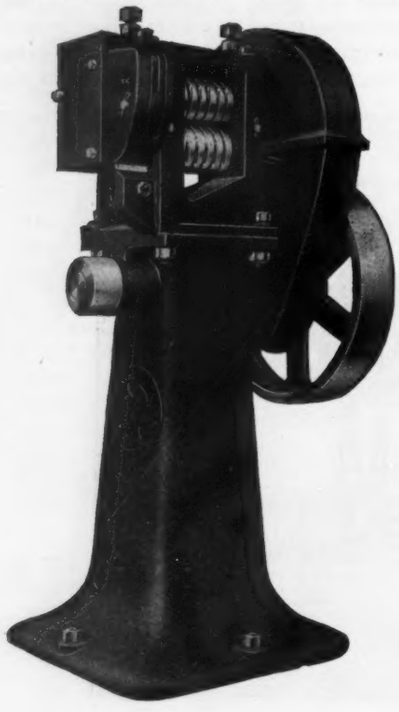
The data covering the crane shown herewith, are as follows:

Lifting capacity, main hoist, 25 tons at 12 feet per minute. Lifting capacity, auxiliary hoist, 5 tons at 60 feet per minute. Speed of trolley, 125 feet per minute. Speed of bridge, 250 feet per minute. Span, center to center of runway rails, 55 feet. Length of crane over all, 103 feet. Distance under side of crane girders to rails, 23 feet.

The United States immigration records for the week ending April 17 show that 203,799 of the foreign labor element have left the United States since Jan. 1, while but 88,445 have landed here.

A COMBINATION POINTER AND SHEAR.

The accompanying illustrations show a rod pointer combined with a light shear, recently designed and built by the Morgan Construction Co., Worcester, Mass. The machine will cut and point rods up to a maximum diameter of 5/16 to 7/16 inches, depending upon stock. The following are the principal features of the machine: It is self-contained and is easily adaptable to independent motor drive if necessary; it combines the functions of a shear with



COMBINATION POINTER AND SHEAR.

those of a pointer, the cost being slightly in excess of that of the latter; the rolls are of the built-up type and when their grooves become worn may be easily repaired by the substitution of new sleeves; the link motion of the shear has been made extremely simple to permit continuous running and insure freedom from repairs; the machine has been made foolproof as far as possible by limiting the opening of the shear jaws and carefully protecting all working parts.

The main frame of the machine, which is mounted upon a pedestal, consists of a heavy housing, at one side of which is cast the shear frame. The shear is of the direct plunger type and is operated from the end of one of the rolls by a simple mechanism, which was designed with a view of continuous operation. Both knives of the shear can be easily removed for sharpening, and they have been so designed that it is impossible to put between the jaws a rod exceeding the capacity of the knives. A window in the housing, within convenient working distance, is provided, through which the rods may be thrust between the rolls for pointing. This has been made as large as is consistent with strength in order to give the operator ample working room.

The built-up rolls are provided with sleeves which are grooved, hardened and ground before slipping upon the arbors. These sleeves can be quickly and inexpensively replaced. Power is transmitted to the machine by belt, which is applied to a belt wheel with a heavy rim, giving fly-wheel effect. This belt wheel drives one of the arbors holding the roll sleeve through a single gear reduction. All gears are machine cut, those of the first reduction being protected by an easily removable gear case. The gears on the roll arbors are enclosed within the housing. A shield thoroughly protects the operator from the working parts of the shear.

When desired the pointer can be supplied with a driving mechanism, which will give a reciprocating motion to the rolls if desired. The pointers can also be made without the shear attachment, both in the rotary and reciprocating types. In this case they are driven from the gear shaft.

The Tennessee Coal, Iron & Railroad Co. will build a steel bridge across Village creek, between Pratt City and Ensley, Ala.

A CLOSE QUARTER AIR DRILL.

Designed for heavier work than could be handled by its No. 8 drill the Independent Pneumatic Tool Co., Chicago, is placing on the market a second air drill for use in extremely close places and known as No. 9 "Thor" close quarter piston air drill.

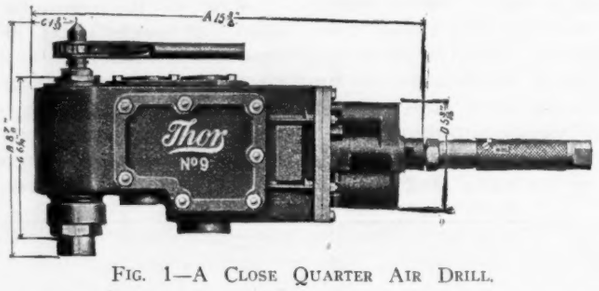


FIG. 1—A CLOSE QUARTER AIR DRILL.

This tool will be capable of drilling up to 3 inches diameter and reaming and tapping up to 2 inches diameter. It is shown in operation in Fig. 2.

The dimensions of the tool are as follows:

A—Distance from throttle connection to outside of spindle case, 15⅜ inches.
B—Distance from point of feed screw to end of socket, 8⅞ inches.
C—Radius from center of feed screw to outside of case, 1 9/32 inches.
D—Width of case at cylinder flanges, 5 3/16 inches.
G—Width of case at spindle, 6¼ inches.
Weight, 31 pounds.
Speed, 122 revolutions per minute.

The spindle is at one extreme end of the tool and the motor is the opposite end. The motor consists of two cylinders parallel to each other, and at right angles to the spindle, the center line of both cylinders centering on the center of the spindle. The pistons are double acting and operate on a two-throw crank. Between the cranks, at the center, are located the eccentrics, cranks and eccentrics being one forging. The eccentric straps operate directly on bal-

FIG. 2—CLOSE QUARTER AIR DRILL IN OPERATION.

anced cylindrical piston valves. The air is taken in centrally between the cylinders, and the valves control the air as close to the cylinder bore as material will permit. Geared to the crankshaft proper is another two-throw crank, diametrically opposed. This crank operates direct on two oscillating levers, centered on the drill spindle proper and having their bearings around the same. These levers are provided with pawls of practically the whole thickness of the lever. The pawls operate on ratchet teeth sunk in the spindle, the outer circumference, being the point of the teeth, leaving ample stock for bearings of the levers. The lever operating the crank is arranged to have its power stroke on the part of the revolution farthest away from the spindle. It, therefore, makes the speed of the lever more uniform, pulls forward considerably more than its half revolution and returns quickly to action. The crank being opposed, the motion of the drill spindle is continuous, with only slight variation. The engine crank proper is not on the usual 90-degree angle, but has an angle of 135 degrees, thus allowing two pistons to pull when the position of the levers requires the greatest power. This makes the drill in a degree self-regulating and tends to still further govern the speed during the entire revolution of the drill spindle. This drill is provided with the reversible ratchet feed mechanism, operated within the width of the body of the drill itself. A poppet valve throttle controls the speed and power, and also acts as a handle.

A NEW VALVE.

The distinctive feature of a new valve being manufactured by the Knudsen von Kothen Mfg. Co., Dolton, Ill., is a cast iron coil spring placed in the bonnet of the valve. By means of this spring, through which the valve stem passes, and suitable metal, bearing gaskets and sleeves a tight joint is made between the valve body and the bonnet and in addition the valve is held firmly against the seat when the stem is screwed down. The arrangement of the spring and other parts of the bonnet are shown in the cross section, Fig. 1, and it is apparent that with an unfailing tension on the spring there will be no leakage from the body of the valve up through the bonnet either of liquid or vapor. This does away with any need of packing which is one of the special features of the valve.

The cast iron spring shown in Fig. 2 is substituted for other devices because of the well-known constancy of its elasticity within certain limits of strain. The spring is so designed as to give an unfailing tension through

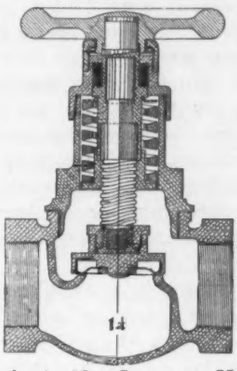


FIG. 1—A NON-LEAKING VALVE.

the life of the valve. Where steel is used in springs the action of heat impairs the temper, which renders the spring valueless, with a leaky valve resulting. All the parts of the valve

FIG. 2—CAST IRON SPRING FOR VALVE.

are nickel plated to prevent corrosion and it is offered as an absolutely non-leaking, non-packing valve for hard, continuous service.

Suicide Follows Receivership.—Receivers for the West Virginia-New Jersey Bridge Co., Trenton, N. J., were appointed May 6, following the suicide of President Morgan D. Magee, of the First National Bank, of Manasquan, N. J. Mr. Magee's bank had loaned upwards of $100,000 to the bridge company, of which he was a stockholder. The application for the appointment of a receiver for the bridge company was made by the Lackawanna Steel Co., a creditor to the extent of $97,000. The bank's loans to the bridge company are said to have caused its embarrassment and the suicide of President Magee.

The American Boiler Manufacturers' Association will hold its convention at Atlantic City, July 14, 15 and 16.

THE INDUSTRIAL SCHOOL AT SYRACUSE.[1]

BY JOHN E. SWEET.[2]

From the number of letters received from all over the country asking about the plan and progress of our Artisan school, there can be no question that there is a widespread feeling, among the manufacturers, at least, that there is a sort of instruction or training needed that our training, trade, military or technical schools, colleges and universities do not supply; and that is the training of men of ordinary intelligence how to work, that they may be able not only to earn a living but to do the work that needs to be done.

The training that is needed is a substitute for the old apprentice system, which has died out because the manufacturers of today can not afford to have apprentices. The investment required per boy renders it impracticable to get work enough from the boys to make it profitable.

The belief is pretty general that there is a lack, and a fast growing lack, of good mechanics. There is a general feeling that far too many of our young men are drifting into idleness and worse. Statistics show that but a small percentage of those who learn trades end their lives in penal institutions. This is in itself enough to justify some movement in the direction of the establishment of schools of trades.

Mr. Van Cleave, president of the Manufacturers' Association, advocates the beginning of industrial training in the public schools at the age of 10 or 12 years. This will call for a great addition to the cost of equipping and running the schools, and while it will be no detriment to any one to learn to use his hands, it will be adding another to the present overburden of studies imposed on the pupils of the grade schools; although the addition of hand work for short periods is so like play that no study taking the same length of time could be added that would add so little to the burdens as manual training.

As it requires about twice the room for each child to do hand work that it does for book work, the additional room and the cost of tools and materials would be so great that the additional taxes for school purposes that Mr. Van Cleave's scheme would require are likely to delay it for many years to come.

There are already many schools es-

[1]From the report of the committee on education of the Syracuse chamber of commerce.
[2]President Straight Line Engine Co., Syracuse.

tablished with the primary object of furnishing places where boys can learn a trade, but these have almost invariably fallen into the hands of school teachers who soon drift into emphasizing the book part of the work, and the hand work becomes of secondary importance.

As an index of what is being done and attempted: The Pratt Institute of Brooklyn is perhaps the oldest, and one that gives more time to hand work than the technical colleges, but the course is shorter, and the graduates, while not full fledged workmen, perhaps because there is too little variety of work and too short time, are so well started that in the main they soon become good men.

The Brown & Sharpe Mfg. Co. and the Baldwin Locomotive Works, and others, perhaps, have so many apprentices that they make special provisions to train them.

The cities of Springfield, Mass., and Milwaukee, have trade schools as parts of their public school systems, something in the way of half-time schools. The manufacturers of Cincinnati have an arrangement with the University of Cincinnati to have half-time apprentices. The state of Mississippi has a special school of trades. At Indianapolis the United States government sold to a group of citizens the abandoned arsenal, which is being used as a school for various trades, to which in foundry work the members of the National Founders' Association contribute. The General Electric Co. and the Westinghouse Electric & Mfg. Co. have established schools of their own.

New York City has invested $1,500,000 in the Stuyvesant Industrial School for teaching in trades and art; and Andrew Carnegie has given several millions to establish such an institution in Pittsburg. A large amount of this money has been put into magnificent buildings.

The Williamson Trade School, near Philadelphia, the New York Trade School, the Jewish School in New York City, and the School of Trades in Milwaukee come nearer making working mechanics than any of the others, though in many cases the graduates, instead of following the trade, find places as teachers in other trade schools or in higher positions. The total number of pupils as yet attending all these schools is so small that they have yet done relatively little to supply the great demand for skillful workmen.

What all the manufacturers feel is needed is skillful workmen; men who can do things and know why, and the only way to get them is through schools where to teach them just these things is the objective point. To say this is easy; to do it is a very different thing. To get the boys is difficult, because it is so hard to convince them and their parents that a trade to a boy who must earn his living is as good as five or six thousands in money; and because so few parents are willing to believe that their boys are not born to be president of the United States. Another trouble is to get the instructors or to learn what kind of a man is required for an instructor.

The problem is a complicated one, and what we are doing at the Artisan school is trying the experiment. In the Winona school at Indianapolis, where they are striving the hardest to establish schools of trades, they are, it is understood, somewhat troubled in getting students. They have not gone far in the machinist trade, which is the hardest to establish and by far the most expensive, as the outfit is extensive per boy and the cost of material is excessive compared to such industries as plumbing and foundry work, where the material can be worked over and over and involve little loss.

At the Artisan school the money paid in is about $26,000, of which about $21,000 has been invested in real estate and tools; and the present plant will suffice for a dozen or more boys, or at the rate of $1,750 per boy; $5,000 more will equip tools enough to accommodate 20 boys, or $1,300 per boy; and it is doubtful, if the limit of 50 boys were reached, whether the investment could be brought to less than $1,000 each.

In the pattern makers' and machinists' trades, the product must be good enough to sell in the open market or to use in the shop, for, if not, the loss will be too great.

The Artisan school has succeeded in making useful and salable goods with very little loss, but it is slow work; and while a part of the time the product has brought perhaps one-quarter the cost of running expenses, if at the end of the three years' course it is able to meet running expenses, it will be an achievement.

One thing which confronts us is this: While at the technical schools they have the pick of the boys, and the examples of the work they show is the pick of the picked, the schools of trades must be exactly what they are intended for, not the pick of the boys, but average boys who by practical training may be developed into skilled workmen.

The first thing that confronted us and will confront others was to get the money to start with. The next is to get the boys; this to begin with means that we must convince them of the value of a trade and that we are going to give them a chance to learn it.

Then comes the question of keeping the boys after we have secured them. This will either involve us in the possibility of inspiring them with pride in their work or else we must pay them for it, which will be a donation, for it is not possible to make the school more than self-supporting if nothing is paid the boys.

We must build up the reputation of the school by turning out work of unquestionable quality. To teach the boys to do good work, we must do good work, which, too, is the only way to inspire them with pride in doing it. Later we must turn out mechanics who can do good work in good time—and this question of time may be the hardest problem in the lot, but we have not come to that yet.

The large industries like the General Electric Co., the Baldwin Locomotive Works, etc., which have established apprentice schools, have advantages that make their enterprises successful, but they train boys for themselves and for their specialties, which gives us no precedent to follow.

The men should not only know how to do all kinds of work, but to do it in the best way, and that involves to a certain extent the why; and this borders on the technology, which must be given as the work goes on and not as a special study. The school established to turn out accomplished workmen must turn out accomplished workmen and nothing else or it will fail in its purpose. To turn out teachers for other schools would be as much a failure as to turn out indifferent workmen.

The boy must want to work, must want to learn to make things, and he must take pride in all the things he makes. The boys who learn to do honest work are quite likely to become honest men; and we must train them to do right by doing right by them, and teach them morality by example.

The North Marquette furnace, Pioneer Iron Co., Marquette, Mich., a charcoal stack, was blown out on May 1. This leaves only one of the Cleveland-Cliffs Iron Co.'s furnaces, that at Gladstone, in blast, the Carp River plant being closed down several months ago indefinitely.

STANDARD CLASSIFICATION OF RAILROAD SCRAP.

The railroad scrap sold at Chicago by the various railroads is made up of so many kinds and conditions of material that it has long been a problem with those who have the handling and selling of the railroad's scrap to so assort and offer their old material as to make it bring its proper value. Two or three kinds of scrap may be bought by a consumer for the same purpose and may, therefore, be grouped under one classification or again there may be two or three lots of scrap of the same essential metal qualities yet of a physical condition which gives them entirely different values and necessitates their separation. In the past, there has been no uniform classification for the guidance of those who should be able to so distinguish between the various materials for their proper association. With a view, therefore, to establishing such a uniform classification which would be adhered to by all the railroads, the Railroad Storekeepers' Association will discuss this matter at the annual meeting on May 25 at the Auditorium hotel, Chicago. Such a classification, if it were established, would be an advantage to the consumer in that he would be able to buy a better graded material and the proper price to pay would become less a matter of judgment and more of a definite and uniform schedule.

To prepare the matter in a form for presentation to the meeting, a committee was appointed consisting of J. P. Murphy, general storekeeper, Lake Shore & Michigan Southern, chairman; M. J. Collins, assistant general passenger agent, Santa Fe; M. E. Towner, assistant to vice president, Frisco lines; A. C. Mann, chief clerk and purchasing agent, Illinois Central; T. J. Frier, general storekeeper, and G. W. Dusoll, Chicago, Burlington & Quincy; J. M. McCarthy, purchasing agent, and F. D. Reed, Rock Island; and H. A. Rouse, general storekeeper, Chicago & Alton. A list of 314 kinds of scrap was prepared and submitted to nine large western roads for their suggestions as to desirable classifications. A meeting was then held on May 11 to consider the returns of this canvass. This meeting was attended by representatives of a number of consumers and dealers, among them the following: Representing consumers—B. L. Venner, Republic Iron & Steel Co.; Wm. Meyers, Highland Iron & Steel Co.; C. F. Burch, Pullman Co.; G. F. Davies, Interstate Iron & Steel Co. Representing dealers—J. S. Miller, U. S. Metal & Mfg. Co.; A. L. Joseph, Jos. Joseph & Bros. Co.; Jos. Michaels, Block-Pollak Iron Co,; S. A. Newman, Ohio Iron & Metal Co.; J. J. Cohen, M. Cohen & Son; U. S. Hirsch, Cal. Hirsch & Sons Iron & Rail Co.; N. Deutch, N. Deutch & Co.

As a result of the conference, the following classification was suggested for presentation to the annual meeting. Prior to that meeting, most extended criticism is invited and suggestions of improvements are eagerly solicited. Communications addressed to J. P. Murphy, general storekeeper, L. S. & M. S. Ry., Box C, Collinwood, O., or to the Chicago office of THE IRON TRADE REVIEW will reach the committee.

RAILWAY STOREKEEPERS' ASSOCIATION.
PROPOSED STANDARD CLASSIFICATION OF RAILROAD SCRAP.
TO BE CONSIDERED AT ANNUAL MEETING, AUDITORIUM HOTEL,
May 25, 26 and 27, 1908.

Number.

1. ARCH BARS AND TRANSOMS: IRON.
2. ARCH BARS AND TRANSOMS: STEEL.
3. AXLES: Driving and other axles, 6 in. diameter and over, iron.
4. AXLES: Driving and other axles, 6 in. diameter and over, steel.
5. AXLES: Car, tender, engine truck and other axles, car and locomotive, under 6 inches diameter; iron.
6. AXLES: Car, tender, engine truck and other axles, car and locomotive, under 6 inches diameter; steel.
7. ANGLE BARS, SPLICES AND FISH PLATES: IRON. Also see No. 62.
8. ANGLE BARS, SPLICES AND FISH PLATES: STEEL. Also see No. 62.
9. BRAKE BEAMS: UNCUT (except cast steel). "I" section of brake beams, with heads and shoes cut off, to be shipped with structural steel.
10. BELTING: RUBBER.
    BELTING: LEATHER, including punchings and trimmings, regardless of width and length.
11. BOLSTERS: UNCUT (except cast steel).
12. BAGS AND BURLAP: Bagging, sacking and waste covering.
13. BARRELS: Oil, standard classification.
14. BARRELS: Paint, standard classification.
15. BOILERS: Locomotive boilers, locomotive tanks, other heavy oil tanks, fire boxes without flues or trimmings, but including mud rings; uncut.
16. BOILERS: Locomotive boilers, locomotive tanks, other heavy oil tanks, fire boxes without flues or trimmings, but including mud rings, cut in sheets and rings.
17. BORINGS: Cast iron, clean and free from other metals, dirt and lumps.
18. No. 1 BRASS: Locomotive brass, including rod brass.
19. No. 2 BRASS: Steam metal brass, including valve fittings.
20. No. 3 BRASS: Car and journal bearings, free from babbitt.
21. No. 4 BRASS: Brass borings, drillings and turnings; not over 4 per cent iron.
22. No. 5 BRASS: Yellow brass castings, including hose couplings, etc.
23. No. 6 BRASS: Coach trimmings and light brass.
24. BRICK: Arch and fire brick.
27. CARPET, LINOLEUM AND PLUSH (specify kind).
28. No. 1 RAILROAD CAST: Free from burnt grates, stove plates and brake shoes; pieces weighing 150 pounds or less, includes clean cast iron culvert, soil and water pipe.
29. No. 1A RAILROAD CAST: Cylinders and wheel centers.
30. No. 2 RAILROAD CAST: Free from burnt grates, stove plates; pieces weighing over 150 pounds, exclusive of wheel centers and cylinders.
31. No. 3 RAILROAD CAST: All kinds of burnt grate bars, castings, grate frames, stove plates, hand car and truck wheels with wrought iron spikes.
32. CHAIN: All sizes, regardless of length; iron. (May be included in No. 1 railroad wrought.)
33. CHAIN: All sizes, regardless of length; steel.
34. CHANNELS: Car truck, iron; cut apart.
35. CHANNELS: Car truck, iron; uncut.
36. CHANNELS: Car truck, steel; cut apart.
37. CHANNELS: Car truck, steel; uncut.
38. No. 1 COPPER: Flue ferrules, pipe, hammer heads, wire.
39. No. 2 COPPER: Sheet copper.
40. No. 3 COPPER: Roofing copper.
41. No. 4 COPPER: Battery copper, dross and oxide. (Report separately.)
42. BABBITT.
43. COUPLERS AND KNUCKLES: Cast steel couplers, knuckles and coupler heads.
44. CRUCIBLES: Old.
45. DRILLINGS AND OILY CHIPS: Wrought iron and soft steel.
48. FROGS AND SWITCH POINTS: 50 pounds and over, uncut.
49. FROG FILLERS: IRON.
50. FROG FILLERS: STEEL.
51. FLUES AND PIPE: Flues and pipes, boiler flues, flue ends, wrought iron pipe, regardless of lengths without removing scrap fittings, such as couplings, elbows, tees, etc.
53. No. 1 HOSE: Free from wire and fittings, including air brake and signal hose.
54. No. 2 HOSE: Steam and water hose, free from wire and fittings.
55. No. 3 HOSE: Engine tank, washout, fire and rubber lined fire hose.
56. No. 4 HOSE: WIRE HOSE AND WIRE INSERTED.
57. LIMED IRON: All kinds (except flues) from the interior of boilers, which are incrusted with lime or corroded by the action of water, such as crown bars, crown bar bolts, staybolts, etc.
58. No. 1 STRUCTURAL AND SHAPED IRON: Channels (except car truck channels), angles, tees, "I" beams, girders and columns, except cast; cut up.
59. No. 2 STRUCTURAL AND SHAPED IRON: Channels (except car truck channels), angles, tees, "I" beams, girders and columns, except cast; uncut.
60. No. 1 STRUCTURAL AND SHAPED STEEL: Channels (except car truck channels), angles, tees, "I" beams, girders and columns, except cast; cut up.
61. No. 2 STRUCTURAL AND SHAPED STEEL: Channels (except car truck channels), angles, tees, "I" beams, girders and columns, except cast; uncut.
    Structural covers building and bridge iron and steel.
    Shaped covers car and pile driver iron and steel.
62. RAIL JOINTS: Continuous and patented joints.
63.
64.
65. MALLEABLE: All clean castings.
66.
67. No. 1 IRON RAIL: 5 feet and over, 50 pounds and over standard T section, free from frog, switch and guard rails and bent and crooked rails.
68. No. 2 IRON RAIL: Cropped rail ends, 3 feet and under.
69. No. 3 IRON RAIL: 3 feet long and under 5 feet, 50 pounds and over standard T section; also bent and crooked rails.
70. No. 4 IRON RAIL: Frog, switch and guard rails.
71. No. 1 STEEL RAIL: 5 feet and over, 50 pounds and over standard section, free from frog, switch, guard and circle rails; fit for rerolling. (Split heads and worn flanges being considered unfit for rerolling.)
72. No. 2 STEEL RAILS: Cropped rails under 3 feet long; 50 pounds and over.
73. No. 3 STEEL RAIL: 5 feet long and over, 50 pounds and over, split heads and worn flanges, curved and bent rails, not fit for rerolling; free from frog, switch and guard rails.
74. No. 4 STEEL RAIL: All sections of rail not coming under specifications of No. 1 or 2 rail, 3 feet long and over and under 5 feet, including frogs, cut apart, guard rails and switch points. Does not include frog fillers or plates.
75. ROPE: Manila fiber, not including tar rope.
76. ROPE: WIRE, included in No. 1 light sheet.
77. No. 1 RUBBER: Rubber boots without leather soles, included in No. 1 hose.
78. No. 2 RUBBER: Rubber packing, gaskets, diaphragms, matting and step treads.

79. No. 3 RUBBER: Rubber valves of all kinds.
80.
81.
82. No. 1 LIGHT SHEET: Under ¼ inch, consisting of cut smoke stacks, netting, wire rope, hoops, band iron and steel, pressed steel hand car wheels, scoops, shovels, iron wire, free from galvanized iron and tin.
83. No. 2 LIGHT SHEET: Galvanized iron and tin, roofing, tinware, etc.
84. HEAVY SHEET: ¼ inch and over, including tank, boiler and fire box steel and iron, cut up, bridge plates, frog and crossing plates.
85. No. 1 BRAKE SHOES: Plain gray iron.
86. No. 2 BRAKE SHOES: Miscellaneous, including all shoes steel back or with steel or wrought iron insert, both driving and car.
87. No. 1 SPRING STEEL: Flat; includes all pieces of flat spring steel, old or broken leaf or elliptic springs, from which the bands and bolts have been removed.
88. No. 2 SPRING STEEL: All coil springs made from steel 3/16 inch and over in any diameter.
89. No. 3 SPRING STEEL: Coil springs made from steel under 3/16 inch in diameter.
90. No. 1 CAST STEEL: See No. 1 Heavy Melting Steel.
91. No. 2 CAST STEEL: See No. 2 Heavy Melting Steel.
92. No. 1 HEAVY MELTING STEEL: Charging box size, 5 feet and under, under 18 inches wide; no pieces under 10 pounds to be shipped, including all steel scrap not otherwise specified.
93. No. 2 HEAVY MELTING STEEL: Over 5 feet long and 18 inches wide; all steel scrap not otherwise specified.
94. No. 3 HEAVY MELTING STEEL: Files and worn-out steel tools, including old claw bars, pinch bars, spike mauls, track wrenches, picks, adzes, axes, chisels, drills, hammers, knuckle pins, punches, tool steel, finger pins, bits, draft keys, bar steel, weighing under 10 pounds per piece.
95.
96.
97. No. 1 TIRES: All locomotive driving, engine truck and coach tires 36 inches and over in diameter, smooth inside; not grooved for retaining rings.
98. No. 2 TIRES: All tires not included in No. 1.
99. No. 1 TURNINGS AND DRILLINGS: Wrought iron and soft steel, clean and free from cast borings, brass, hard steel, other metals, dirt and lumps.
100. No. 2 TURNINGS AND DRILLINGS: From tires and other similar steel, including hard steel; clean, free from other metals, dirt and lumps.
101. No. 1 TURNINGS, DRILLINGS AND BORINGS: Wrought, cast and steel mixed; free from other metals, dirt and lumps.
102. No. 2 TURNINGS, DRILLINGS AND BORINGS: Wrought, steel and cast mixed with brass and other metals; free from dirt and lumps.
103. TARRED ROPE AND MARLIN.
104. TRACK SPIKES, BOLTS AND NUTS. (May be included in No. 1 Wrought.)
105. No. 1 WHEELS: Cast iron, including car, tender and engine truck; no allowance for grease and dirt.
106. No. 2 WHEELS: Steel tired; specify kind.
107. See below.
108. No. 1 RAILROAD WROUGHT: Clean wrought iron, from railroad equipment, 6 inches long and over, to include tie straps from arch bars, drawbar yokes and bolts (except track bolts), bridge iron in bars or rods, switch rods, heavy chain, links and pins; free from rivets material.
107. EXTRA NO. 1 RAILROAD WROUGHT: Rods and bars 1½ inches in diameter and larger; 6 feet and over.
109. No. 2 RAILROAD WROUGHT: All wrought iron under 6 inches long, to include track bolts and nuts, rivets, lag screws and heavy punchings.
110.
111. WIRE, TELEGRAPH, IN ROLLS.
113. ZINC.

The Chicago & Alton has ordered five locomotives from the Baldwin Locomotive Works.

BOOK REVIEW

"Standard Handbook for Electrical Engineers." Written and compiled by a staff of specialists. New York: McGraw Publishing Co. 4 x 6¾ inches. xx + 1283 pages. Illustrated. Flexible leather. Supplied by THE IRON TRADE REVIEW for $4.

Without question this is the most complete handbook for electrical engineers that has yet appeared in this country. The range of subjects that it covers is vast, and each subject is completely and clearly dealt with. The manner of making the book not only insured the treatment of the various departments of electrical engineering in the most able manner, but rendered the presentation of facts and theories in accordance with the latest developments and knowledge. Twenty men were engaged in the preparation of manuscript, each a specialist in his particular line of electrical engineering, and each standing near the head of the profession. Each man wrote on the branch of the subject which he was best qualified to handle, and the preparation of the manuscript, therefore, required but one-twentieth of the time that would have been necessary had a single author done the work.

In a review of this character, it is impossible to give more than a bare outline of the subjects handled. The section headings, as given by the table of contents, are as follows: Units; Electric and Magnetic Circuits; Measurements and Measuring Apparatus; Physical, Electrical and Magnetic Properties of Materials; Magnets; Transformers; Electric Generators; Electric Motors; Batteries; Central Stations; Transmission and Distribution; Illumination; Electric Traction; Electrochemistry; Telephony; Telegraphy; Miscellaneous Applications of Electricity, including Machine Tools, Pumping, Hoisting and Conveying, Rolling Mills, Heating, Mining, etc.; Wiring; Standardization Rules; Tables and Statistics.

The scope of some of the sections of greatest interest to mechanical engineers may be briefly commented on. The section on magnets considers tractive magnets for both continuous and alternating currents, giving formulae and curves for design and the results of operative tests. Field magnets are also taken up, together with the question of heating and winding calculations.

The section on transformers is unusually complete. It considers transformer theory, design and cooling, and presents considerable information on commercial lines of transformers. Transformer testing and phase transformation are also fully dealt with. Other subjects considered are 3-phase transformers, auto-transformers, series and constant current transformers, regulators and converters of various types, including the mercury vapor converter.

The section on generators is very complete, as is that on motors, going into the questions of design, operation, testing and applications of both classes of machines of all types.

Nearly 30 pages are devoted to storage batteries, going into questions of cost, plates, performance, operation and care, uses, regulation, etc. Practical examples in the use of storage batteries are also given.

Central stations occupy over 100 pages. They are classified as regards their prime mover into hydro-electric, steam, gas and oil driven stations. Data relating to design and operation of these various classes of stations are clearly and concisely given, together with other data on switchboards.

Voltage control systems, lightning protection, etc., are discussed. The subjects of general design, location, choice of system, arrangement and foundations form the basis of a subsection of this heading, as does testing.

The section on transmission and distribution gives formulae, rules and examples for the calculation of systems, and discusses the various systems in use. It also treats of the economies of transmission, line construction and mechanical transmission.

The section on illumination considers the various systems in use, light distribution, illumination requirements, shades and reflectors, and the different types of lamps available and their adaptability.

Electric traction receives a large amount of attention, covering the various types of motor available, train resistance, speed-time curves, power consumption, motor capacity, motor control, braking, car trucks and bodies, electric locomotives and distribution systems. A short section is devoted to block signals and switches.

Considerable information is given throughout the book as to costs, and standard practice is well presented, the standardization report of the American Institute of Electrical Engineers being printed in full. In short, the book contains material on almost every question likely to arise in ordinary electrical engineering. It should be of great value to every electrical engineer, and to a large majority of those in the mechanical engineering profession.

Prices Reach Year's High Mark

The New York market last week was active and, although somewhat irregular, tended to maintain fairly well the advances made earlier in the week, which in many cases carried prices to the highest figures of the year. Easy money, call rates running from 1¾ to 2 and three to six months time money ruling 3½ per cent, expectations of improvement in business, further ability of the railroad companies to borrow, and support in the market by the larger interests were factors in the general advance. The movement of gold from New York to Europe last week amounted to $10,250,000, of which $2,500,000 went direct to Germany, the total gold exports in this movement amounting to $25,100,000. Funds are still flowing from interior cities to New York City.

Transactions Thursday reached 1,212,000 shares, which is the highest figure since the beginning of the present year. At the same time, a large number of both active stocks and specialties reached the highest quotations recorded since last fall's panic. The activity was well distributed among various stocks, and there was an apparent increase in the orders to purchase stocks from the general public. The official report of idle railroad cars placed the number at 413,338, the largest on record. Business failures for the week ending May 14 numbered 281 compared with 288 for the previous week and 184 for the corresponding week for 1907. Smelting and copper stocks were higher, although there was no change in quotations for the metal itself. The Bank of England rate remained unchanged at 3 per cent, and the Berlin rate at 5 per cent. The New York bank statement was more favorable than the preliminary estimate. The clearing house banks increased their loans $4,777,800; deposits, $5,895,700; reserve, $2,197,700; surplus, $723,755. The percentage of reserve of the clearing house banks was 29.88. Non-member banks and trust companies showed aggregate deposits of $897,160,300; total cash on hand, $61,061,400, and loans amounting to $861,556,200.

Copper Stocks.

Boston.—Butte Coalition closed 24⅝, a net gain of 2⅛; Calumet & Hecla closed 670, a net gain of 10; Calumet & Arizona closed 111½, a net gain of 6½; North Butte Mining closed 64¾, a net gain of 5⅞; Quincy Mining closed 87½, a net gain of 5½.

New York.—Amalgamated Copper closed 68⅛, a net gain of 6⅛.

Financial Notes.

The Railway Steel Spring Co. declared the regular quarterly dividend of 1¾ per cent on preferred, payable June 20; American Ship Building Co., the regular quarterly dividend of 1 per cent, payable June 1, this being the last of the 1 per cent quarterly dividends declared a year ago; the Pittsburg, Bessemer & Lake Erie railroad, semi-annual dividend of 3 per cent on preferred stock, payable June 21; J. A. Fay & Egan Co., regular dividend of 1¾ per cent on preferred and 1¾ per cent on common, both payable May 20; the National Enameling & Stamping Co., regular quarterly dividend of 1¾ per cent on the preferred payable July 1; Quincy Mining Co., quarterly dividend of $1 a share, payable June 13, the last dividend being $1.50 in February; the Saco & Pettee Machine shops, semi-annual dividend of 4 per cent on common and regular semi-annual 3 per cent on preferred, both payable June 1; the Barney & Smith Car Co., regular quarterly dividend of 2 per cent on preferred, payable June 1.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. May 16	Changes in Week	Date 1908 Ann. M't'g	Stock Outstanding	Dividend		
					Basis	Last Declared	Date Last Div. Pay.
Allis-Chalmers	9¼	+ ⅜	Sept. 3	19,820 000			
Allis-Chalmers pr	24⅜	+2⅜		16 150,000	7 cum	1¾ Q.	Feb., 1904
American Can	5¾	− ⅛	Feb. 3	41 233 300			
Am. Can pr	56¾	+1¾		41,233,300	7 cum	1¾ Q.	April, 1908
Am. Car & Foundry	57¾	+ ⅞	June 25	30,000,000		1 Q.	April, 1908
Am. Car & Fdy. pr	96½	−1½		30 000.000	7 n. c.	1¾ Q.	April, 1908
American Loc	50⅞	−1	Oct. 20	25,000.000	5	1¼ Q.	May, 1908
American Loc. pr	103	+ ¼		25.000.000	7 cum	1¾ Q.	April, 1908
American Ship	45	−1¾	Oct. 14	7 600.000	4	1 Q.	June, 1908
American Ship pr	96	.....		7,900.000	7 n. c.	1¾ Q.	April, 1908
Am. Steel Foundries	6⅞	+ ⅜	Oct. 6	15.810 000			
Am. Steel Foundries pr	34	+2		17,240.000	6 cum	2½	Aug., 1904
Barney & Smith	50	.....	June 2	2.000.000	4	1 Q.	Sept., 1907
Barney & Smith pr	90	.....		2 500 000	8 cum	2 Q.	June, 1908
Bethlehem Steel	15	− ½	April 7	14,862,000			
Bethlehem Steel pr	40¾	+ ¾		14 968 000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	31⅜	+1⅛	March 17	45.000 000*	6	1½ S. A.	Feb., 1908
Cambria Iron	45	−1		8,468.000*	4	2 S. A.	April, 1908
Chicago Pneumatic Tool	26	+3	Feb. 17	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	28¾	+1	Oct. 19	34 235 500		3½	April, 1902
Crucible Steel	5⅛	.....	Oct. 21	24.578 400			
Crucible Steel pr	40¾	+1¼		24,436.500	7 cum	1 Q.	Dec., 1907
Empire Steel	8	.....	Feb. 26	1,254,770			
Empire Steel pr	40	.....		2 500,000	6 cum	3 S. A.	Jan., 1907
Fay & Egan	100	.....	Feb. 18	1,000,000	6	1½ Q.	May, 1908
Fay & Egan pr	110	.....		1,000 000	7 cum	1¾ Q.	May, 1908
General Electric	139¾	+2⅜	May 12	65,167,400	8	2 Q.	April, 1908
Harbison-Walker	11	.....	Jan. 20	18,000.000		½	Oct., 1907
Harbison-Walker pr	66	.....		9.6 0.000	6 cum	1½ Q.	April. 1908
International Pump	23	−1⅜	June 2	17,787 300		1	April, 1905
International Pump pr	72½	+ ½		13,835,000	6 cum	1½ Q.	May, 1908
Lackawanna Steel	32	.....	March 11	34,971 400			
Lake Sup. Corp	6	.....	Oct. 7	40,000,000			
New York Air Brake	71½	+ ⅞	June 18	8.012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	130	.....	Feb. 5	8.500 000	6	1½ Q.	June, 1908
Niles-Bement-Pond pr	100	.....		2.000,000	6 cum	1½ Q.	May. 1908
Otis Elevator Co	35	.....	March 16	6.156,600		1½ S. A.	April, 1908
Otis Elevator Co. pr	87	+2		5 449,500	6 n. c.	1½ Q.	April, 1908
Penn. Steel	63	+3	May 11	10.750 000			
Penn. Steel pr	96	+3½		16.5'0 400	7 n. c.	3½ S. A.	May, 1908
Pittsburg Coal Co	13⅜	+2	Feb. 10	28,853.400			Nov., 1906
Pittsburg Coal Co. pr	44	+3		27,030.800	7 c.	1¾	April, 1905
Pressed Steel Car	29¼	+ ¼	Feb. 19	12,500,000		3	Aug., 1904
Pressed Steel Car pr	84¾	.....		12.500.000	7 n. c.	1¾ Q.	May, 1908
Pullman	158⅞	− ⅛	Nov. 11	100 000 000	8	2 Q.	May. 1908
Railway Stl. Spring	37½	+3	March 5	13,500.000	4	2 S. A.	April, 1908
Railway Stl Spring pr	85	.....		13,500.000	7 cum	1¾ Q.	June, 1908
Rep. Iron & Steel	19¾	+1⅜	Oct. 21	27,191.000			
Rep. Iron & Steel pr	71¼	+3⅜		20,416.900	7 cum	1¾ Q.	April, 1908
Sloss-Sheffield	52	+5¼	March 11	10,000,000	5	1¼ Q.	Mar., 1908
Sloss-Sheffield pr	92	.....		6,700.000	7 n. c.	1¾ Q.	July, 1908
U. S. Pipe & Fdv	27⅝	+1¼	June 24	12,500,000	4	1 Q.	Dec., 1907
U. S. Pipe & Fdy pr	75½	+ ¾		12 500,000	7 n. c.	1¾ Q.	June, 1908
U. S. Steel	38⅝	+1⅜	April 20	508,302,500	2 n. c.	½ Q.	June, 1908
U. S. Steel pr	102⅝	+1¼		360,281,100	7 cum	1¾ Q.	June, 1908
U. S. Steel 5's	96¼	.....		463,798 000	5	5 A.	.....
Va. Iron, Coal & Coke	56	+8	Nov. 17	9,073 680			
WestinghouseElec	53	+6	June 24	23 933.200*	10	2½ Q.	Oct., 1907
WestinghouseAir Brake	99½	+ ⅛	Oct. 6	11.000,000*		2½ Q.	April, 1908

Par value of shares, $100, except those starred (*), $50

The repairs on the Quinn furnace, a charcoal stack at Gadsden, Ala., have been about completed, and plans are being made to put the furnace in blast within the next two weeks.

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Hardware Mfg. Co., Milwaukee, capitalized at $5,000, has these incorporators: Charles F. Zimmerman, John W. McMillan and James R. Petley.

The Automatic Steeling Co., Milwaukee, Wis., has been chartered with a capital of $25,000 by Paul M. Bryant, Rossiter Lines and Harrison S. Green.

The Chalybeate Springs Iron Ore Co., Bell county, Ky., with a capital of $25,000, has been chartered by W. H. Finley, C. S. McManus and J. Gaines Moss.

W. H. Jones, Thomas W. Mealer, Clara Stannus, Lehman Levy and David M. Levy have incorporated the Mechanical Construction Co., Cincinnati, with a capital of $50,000.

Livingston Iron & Metal Co., Danville, Ill., dealer in metals, has been capitalized at $5,000 and incorporated by the following: Walter T. Gunn, Homer Livingston and Richard C. Gregg.

The Minot Foundry & Machine Co., Minot, N. Dak., has applied for a charter through the following, all of Minot: John Ehr, L. Lee, John A. Elliott, and others. The capital stock is $50,000.

L. G. Blessing, C. L. Bastian and G. Langhenry have incorporated the C. L. Bastian Co., 87 Washington street, Chicago. The company will manufacture metal products, and has a capital of $50,000.

The Federal Foundry Supply Co., Cincinnati, O., has been chartered by A. T. Nicholas, H. L. Jollay, P. Winchester, G. M. Roberts and E. S. Byers. The capital stock is $30,000.

The Bancroft & Barnard Co., Gardner, N. Y., machinist, has filed articles of incorporation, with a capital of $10,000. Frank H. Bancroft is president, and Charles A. Barnard, treasurer and clerk, both of Gardner.

D. O. James Mfg. Co., 1103 Tacoma building, Chicago, has been incorporated to manufacture cars and machinery. D. O. James, David E. Cohn and Robert Wallace are the incorporators. The company's capital is $75,000.

A charter has been granted to the Scientific Instrument Co., Monon building, Chicago, to do a general manufacturing business, with a capital of $10,000. A. B. Potter, J. O. Mulvey and C. T. Parker are the incorporators.

The Pulaski Foundry & Machine Co., Pulaski, Va., hardware dealers, has been incorporated with $10,000 to $20,000 capital stock. G. Laughan is president; Robert Buns, vice president, and A. B. Hunt, secretary and treasurer, all of Pulaski.

The Foley-Gregory Engine Co., 816 the Rookery, Chicago, has been incorporated to manufacture machinery. The capital stock is $25,000, and the incorporators are: Daniel F. Flannery, William McKinley and Sadie Longwell.

W. O. Sweetser Co., New York City, to manufacture steel and iron work, with a capital of $1,000, has been chartered by Warren O. Sweetser, Bertha B. Graser and Faith M. Sweetser, White Plains, N. Y.

John Goffin and John F. Zelfaug, Niagara Falls, N. Y., and George M. D. Heard, Painesville, O., have incorporated the E. S. Brace Co., Niagara Falls, N. Y., to manufacture carpenters' braces, tools, etc., with a capital of $35,000.

The Taxi-Motor Cab Co. of Philadelphia, Jersey City, N. J., with an authorized capital of $300,000, has been incorporated by the following: Cornelius A. Cole, Richard F. Tuily and F. Vreeland. The company is to manufacture motors, etc.

The Willex Mfg. Co., Rome, N. Y., has filed articles of incorporation to manufacture gasoline engines, etc., with a capital of $10,000. The incorporators are: F. W. Mills, H. M. Brown, and E. J. Forham, 154 Nassau street, New York City.

The Emrick Pulp Machine Co., St. Louis, Mo., has been incorporated to manufacture and deal in pulp machines; capital stock, fully paid, $10,000. Those interested in the new enterprise are: Frank M. Wohl, Z. G. South, Max A. Cohn and Frank C. Emrick.

To manufacture and deal in boiler washing machinery, heating plants, etc., the American Boiler Washing Co. has been incorporated at St. Louis, Mo., with a fully paid capital of $50,000. Those interested are Frederick A. Gale, Adolph Horn and L. Frank Ottofy.

Articles of incorporation have been filed by the International Generator Co., Hoboken, N. J. The company is to manufacture machinery with $100,000 capital, and has these incorporators: J. E. Whiting, W. P. Jessup, 7 Nassau street, New York, and Frank C. Pringle, Hackensack, N. J.

The John T. Young Boiler Co., Norwich, Conn., was granted a certificate of incorporation, to manufacture steam and hot water boilers and heating apparatus, with a capital of $100,000. John T. Young and Arthur J. Dawley, of Norwich, and Augustus W. Dodge, of Springfield, Mass., are the incorporators.

Articles of incorporation were granted the Screw Machine Products Corporation, Providence, R. I., through the following: Arthur C. Steere, Harry M. Mays and George Briggs Jr. The company is formed for the purpose of manufacturing, buying and selling metal goods of all descriptions, and is capitalized at $100,000.

A charter has been granted to the Campbell-Stagg Co., New York City, to manufacture mechanical and electrical devices, etc., with an authorized capital of $10,000. The new company has these incorporators: William G. Campbell, 352 West 118th street; Henry E. Moore, 1090 St. Nicholas avenue, both of New York, and DePeyster Stagg, Hackensack, N. J.

Incorporation papers were issued to the Acme Mfg. Co., Cincinnati, which will manufacture hardware and patented specialties. The company is capitalized at $10,000, which will be increased shortly. The incorporators, who are now looking for a location for their proposed plant, are as follows: John M. Cornish, George E. Brill, C. S. Nagel, Theodore Fischer and Ralph Talbot, all of Cincinnati.

C. F. Ackerman, W. C. Rhodes, E. M. Fassig, C. H. Taylor and C. H. Taplin, all of Cleveland, have incorporated the United Metals Casting Co., capitalized at $10,000.

The Gearless Motor Car Co., Rochester, N. Y., has been incorporated to manufacture motor vehicles by W. H. H. Rogers, George F. Roth, John W. Breyfogle, W. Bausch and John J. McInerney, of Rochester, N. Y. The capital stock is $300,000.

The Ball-Cooley Engineering Co., New York City, has been chartered with a capital of $25,000, to manufacture rotary engines. The incorporators are Walter Ball, Rochester, N. Y., John F. Cooley, Boston, Mass.; Conrad Hubert, 304 Hudson street, New York City.

A charter has been granted to the George R. Trumbull Electric Mfg.

Co., Trenton, N. J., to manufacture standard and electrical specialties, with a capital of $50,000. The incorporators are George R. Trumbull, N. B. Trumbull and J. A. H. Deep, all of Trenton, N. J.

The Automatic Machine Mfg. Co., Cincinnati, has filed articles of incorporation with a capital stock of $100,000. The company has been organized to sell coin controlled devices, and has the following incorporators: John S. Woods, J. E. Anderson, Charles R. Hubbard, John A. Rule and Colter Rule.

The American Brass & Specialty Co., Columbus, O., has incorporated with a capital stock of $30,000, to manufacture and sell various specialties and operate a brass furnace. The incorporators are: Willis F. Houser, Frank R. Main, Otto O. Walton, G. A. Radford and W. H. Henry.

New Construction:—

The Spuck Iron & Foundry Co., St. Louis, has purchased a site 60 x 125 feet, on which it proposes to erect an addition to its plant.

Frederick Lutz has purchased ground at Alma, Kans., and will erect and equip a plant for the manufacture of steel tanks.

The Textile Machine Works, Wyomissing, Pa., has been enlarged by the installment of a foundry department for the manufacture of gray iron castings.

The Emerson Pump Co. is planning enlargements and betterments to the Emerson plant in Alexandria, Va., $200,000 having been placed to the credit of the company's building fund.

An addition to the plant of the Stover Engine Works, East Freeport, Ill., is being erected for use as a light machine shop and stock room. It is of frame construction, one story, 60 x 90 feet.

The Christie Iron Works, New York City, has leased for 17 years a lot 50 x 100 feet, on the east side of Eleventh avenue, and will build a reinforced concrete building to house the plant.

The Marquette Boiler & Sheet Iron Works, Marquette, Mich., E. F. Kennedy, proprietor, has added additional equipment to its plant, including an 8,000-pound punch, a new power shears and flue cutter.

The Peninsula plant of the Wheeling Mold & Foundry Co., Wheeling, W. Va., has just been extensively improved, a 40-foot addition to the west, east and north portions of the main building having been made. Work at the plant has been resumed, after several weeks of idleness.

The Havana File & Cutlery Co., Havana, Ill., of which there was talk of removing to another city, has been induced to remain by business men purchasing a tract of land upon which they will erect a building 35 x 70 feet, for the accommodation of the plant.

The William J. Oliver Mfg. Co., Knoxville, Tenn., mining and contractors' equipments, has under construction a new erecting shop, 80 x 220 feet, and is providing other improvements to its plant, including the remodeling of its power plant, installing conveying machinery for heavy products, etc.

The Lorain Steel Co. is completing the principal part of a new building at Johnstown, Pa., which will be devoted to the manufacture of T rail specialties, and expects to occupy it by June 1. The rest of the structure, it is announced authoritatively, will require three or four months to complete.

F. M. Mackin & Co., Baltimore, brass founders, are planning two additions to their property, 507-509 North Spring street, and an additional story will be added in the rear of the foundry, 32 x 31½ feet, and a two-story brick building 18 x 31½ feet to another part of the property, at an aggregate cost of $1,100.

The Milwaukee Steel Fence Post Co., Milwaukee, whose incorporation was recently noted, is establishing a small factory to manufacture its product. The company announces that the equipment it requires includes a press, two-inch stroke, able to punch a one-inch hole through half-inch iron, and a gang drill.

The Triumph Electric Co., Cincinnati, which recently increased its capital from $125,000 to $1,250,000, will start work shortly on the proposed new plant on the grounds of the Factory Colony Co., at Oakley. The capital, consisting of $500,000 six per cent preferred and $750,000 common stock, has been almost wholly subscribed.

The Narragansett Machine Co., Pawtucket, R. I., has prepared plans for an addition to its plant at South Woodlawn, the contract for which has been awarded. The addition will be of brick, two stories in height, 50 x 150 feet, and when completed will be occupied by several departments that have outgrown their present quarters.

The Colorado Stove & Furnace Co., Colorado City, Colo., has just finished the erection of buildings at Grand and Second streets, a part of the extensive plans of the stockholders. The officers of the company are: President, John Murray; vice president, G. A. Foote; manager, C. W. Cunningham; secretary, F. W. Moser; and treasurer, Earl C. Heinley.

The Arthur Koppel Co., manufacturer of industrial and portable railway, is erecting an extension to its plant at Koppel, Pa., which will be devoted to the manufacture of portable tracks of special design. The addition is being built with concrete base and corrugated siding over steel frame. The rapid increase of the portable track trade of the Arthur Koppel Co. has made imperative the extension of its plant facilities.

General Industrial:—

The Walnut Machine & Brass Co., Toledo, O., has increased its capital stock from $10,000 to $25,000.

Notice of the increase in the capital stock of the Fort Wayne Iron Stove Co., Fort Wayne, Ind., from $35,000 to $60,000, has been filed.

An increase in the capital of the Rockford Machine & Shuttle Co., Rockford, Ill., has been certified, the increase being from $6,000 to $20,000.

The Mumfordville Bridge Co., Hart county, Ky., has filed an amendment to its articles of incorporation, increasing the capital from $30,000 to $40,000.

The Beaver Falls Mfg. Co., Beaver Falls, Pa., recently shipped a car load of sledges to Panama for use on the canal, a part of a large government order.

The chamber of commerce of Oswego, N. Y., has undertaken to secure a new site for the Ames Iron Works Co., which had announced that it would remove to Erie, Pa., otherwise.

The Illinois Engineering Co., Chicago, has been awarded the contract for the automatic vacuum heating system to be installed in the $3,500,000 Hotel LaSalle.

The equipment of the Ashtabula Foundry Co., Ashtabula, O., has been sold and shipped by its owner, S. F. Mills, of Port Chester, N. Y., to Buffalo, where it will be used in foundry work.

At the annual meeting of the stockholders of the Coleman Iron Works Co., Savona, N. Y., the following directors were elected: I. B. Coleman, J. E. Bedell, J. R. Hedges, D. T. Dimmick and J. N. Jenks.

A deed of assignment from the D. D. Flanner Boiler Co. to William F. McGuire, has been filed in probate court at Toledo, O. The assets are estimated at $4,000 in personal property, and $2,000 in real estate.

A new company under the name of the American Mfg. Co., headed by W. G. Jenks, has purchased the Meisel manufacturing plant at Port Huron, Mich., and will continue to make machinery for sugar refineries. The capital invested is about $200,000.

Judge Reid, of the supreme court in New Haven, Conn., declined a few days ago to discharge the receivers of the National Steel & Wire Co., on the ground that a number of suits to recover on claims to the amount of about $600,000 are still pending.

Buffalo creditors of the Albany Brass & Iron Co., Albany, N. Y., which went into the hands of a receiver March 16, filed a petition in bankruptcy May 5 against the corporation. The management of the company will be turned over to a receiver to be named by the United States district court.

The American Nut Machine Co., New York City, John A. May, president, and Fred J. Mowrey, vice president, has just been formed to take over new patents covering a process of making steel nuts. The company will proceed at once to manufacture and market the machines in the United States, Canada and Mexico.

The Northwestern Foundry Supply Co.'s plant at Milwaukee Junction, Mich., was sold, May 4, at bankrupt sale, to the American Blower Co. The bid of $11,000, subject to $27,000 land contract, has been confirmed by the referee in bankruptcy. The plant will be operated as a department of the American Blower Co.

The Berry Range & Mfg. Co., Springfield, Mo., has leased a building at 307 East Water street, and will take possession June 1, when it will begin the manufacture of stoves and ranges. The stockholders and officers of the company are: President, D. D. Berry; vice president, A. J. Eisenmayer; treasurer, F. X. Heer.

In the construction of one of the switches leading to the plant of the National Tube Co., Lorain, O., the B. & O. is relaying the rails on steel cross ties, the first ever used on that division of the road. Several stretches of track will be built in the locality of Lorain with steel cross ties as an experiment.

The LaBelle Iron Works Co., Steubenville, O., shot its fourth paying oil well in the Follansbee pool, W. Va., May 8, the well showing from 200 to 300 barrels per day. The first well is doing 75 barrels per day, the second 150 barrels, and the third about 250 barrels. The revenue per month therefrom reaches something over $30,000.

Frank L. Patterson & Co., New York City, manufacturer of steam appliances, advises that its recent incorporation is simply a matter of convenience. It has heretofore been a firm engaged in the manufacture of feed water heaters and other appliances, for over 10 years. No changes are contemplated in either the plant or output.

The Great Falls Iron Works, Great Falls, Mont., has completed a crushing roll of unusual size for the Boston & Montana smelter. The roll shells are 41 inches in diameter, and 16 inches wide. The roll is used to reduce ore to a fine mesh, so that it can be further concentrated on fine jigs. The weight of the roll is 35,000 pounds.

The Globe Foundry Co. advises that its recent incorporation was a division and separation of its two foundries at Port Chester, N. Y., and Huntington, W. Va., under separate corporations. The company will continue to operate the Port Chester plant. In addition to making cast iron soil piping, fittings and plumbers iron work, it will add coal and gas ranges. The company's present melt is about 30 tons per day, but with the full line of patterns completed, it will probably increase this about 10 tons per day.

At the annual meeting, May 7, of the Capitol Lock-Nut & Washer Co., Columbus, O., the board of directors was reduced from nine to seven, and the following officers and directors were elected: J. F. Dickson, president; A. M. Gaines, vice president and general manager; William Singleton, secretary and treasurer; H. B. Hutchinson, Frank B. Hubbard, W. E. Meade, of Columbus, A. M. Foster, of Cleveland, and O. E. Foster, of Buffalo. The annual report showed a good run of business up to the business depression, and the outlook is reported as fair.

The Dutcher Steel Casting Co. is being formed in Milwaukee, to succeed the Dutcher Co., which recently made voluntary assignment, in the operation of the Milwaukee plant. Assignee Topping has been granted permission by the court to lease the plant after spending $500 for furnace repairs. The assignee gives the plant's book value at $300,000, subject to a mortgage for $83,900, including $1,500 personal property, aside from $11,000 of book accounts and $6,000 worth of flasks and tools. The board of directors is composed of W. O. Goodrich, George A. Goodrich, H. F. Andrae, John H. Hetherington and M. Seaboth.

Trade Notes:—

The Chicago store of Jenkins Bros., packing and valves, has been removed from 31-33 North Canal street to larger quarters at 226-228 Lake street, corner of Franklin street.

Donald Campbell, attorney and counselor at law, announces his change of location from 56 Pine street, to 45 Broadway, New York City, where he will carry on his business in patents, trade marks and copyrights.

Walter B. Snow, publicity engineer, has recently increased his facilities by removal to larger quarters at 170 Sumner street, Boston, Mass., together with the establishment of an addressing and mailing department, in connection with which select mailing lists will be maintained for the special use of his clients.

The Crescent Machine Co., Detroit, manufacturer of pins, radiator chaplets, etc., has changed its name to the Crescent Brass & Pin Co. Owing to the fact that it has discontinued the manufacture of machinery of all kinds, except such as it will use for its own requirements, it will manufacture along the line of the name, especially in the brass and pin department.

The Darley Engineering Co., New York City, engineer and contractor, has been formed for the purpose of engineering, manufacturing and selling machinery and appliances for hoisting and conveying machinery by suction and air pressure. The company has acquired in this country the rights to manufacture and sell conveyors heretofore controlled by the Economic Engineering & Construction Co., Chicago. President W. D. Darley will have charge of the Pittsburg office; W. A. Stadelman and Secretary and Treasurer M. S. Chapman are to have charge of the New York office. Vice President W. A. Sharp will be in charge of the Chicago headquarters.

Fires:—

Fire recently caused considerable damage at the foundry of the Giddings & Lewis Co. at Fond du Lac, Wis.

The pattern shop of the Frontier Engine Works, Buffalo, N. Y., was damaged to the extent of $5,000, May 6. Fully covered by insurance.

The Beaudry machine shops, Montreal, Canada, was recently damaged by fire, which resulted from the storage of gasoline, sustaining a loss to the amount of about $3,000.